

THE NUFFIELD FOUNDATION

*Report for the
year ending
31 March 1950*

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THE OBJECTS OF THE FOUNDATION ARE

'(i) the advancement of health and the prevention and relief of sickness . . . in particular . . . by medical research and teaching and by the organization and development of medical and health services . . .

'(ii) the advancement of social well-being . . . in particular . . . by scientific research and the organization development and improvement of technical and commercial education including the training of teachers and provision of scholarships and prizes

'(iii) the care and comfort of the aged poor.'

THE RESOURCES of the Foundation consist of the Nuffield Fund, which is a capital fund of £10,000,000, provided by Lord Nuffield, and the Auxiliary Fund, for which the trustees may accept gifts and bequests from other persons wishing to advance the objects of the Foundation.

OLIVER BIRD FUND

The objects for which the Managing Trustees hold the OLIVER BIRD FUND of £450,000 on trust as part of the Auxiliary Fund of the Foundation are 'the promotion of research into the prevention and cure of rheumatism or (if . . . the Managing Trustees shall . . . be of the opinion that expenditure upon research into the prevention and cure of rheumatism is undesirable or undesirable beyond a certain amount) the relief of incurable cases of rheumatism or the advancement of health and the prevention and relief of sickness other than rheumatism. . . .'



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The Fifth Report

of the Nuffield Foundation

INTRODUCTION

IN conformity with the Founder's commission, embodied in its trust deed, the Foundation applies its resources to the furtherance of research and education leading to 'the advancement of health and of social wellbeing'. The first programme to this end, which was completed a year ago, was concerned chiefly with the medical, natural, and social sciences. During that first quinquennium the Foundation selected and supported projects which seemed likely to advance the frontiers of knowledge in each of these groups of sciences. But the motive was not simply the pursuit of new knowledge for its own sake: every project was measured against its presumed—even its speculative—contribution to the practical betterment of life. Most of the research which the Foundation financed was in fact fundamental, rather than applied, research which happened to be relevant to the Foundation's purpose and interests. And so it will continue to be in the second quinquennial programme, the first year of which is covered by this report.

Five years is a short time in which to complete any major programme, and many of the Foundation's earlier interests are being further pursued or rounded off as part of its present programme. In at least one case—chronic rheumatism—the opportunities which the Foundation sought in its earlier years have opened up more promisingly now than ever they did before. These and other chances as they occur of pressing forward research of lasting importance to knowledge and benefit to man will be seized—whether or not they fall within a programme that can, in any case, be only a tentative

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indication of the fields in which the Foundation believes that progress may be profitably sought and found.

For the second quinquennium the Foundation had announced its intention to seek opportunities of furthering the search for new knowledge, especially in the fields of biological and sociological studies, and also to support or initiate attempts to apply existing knowledge to practical problems of contemporary importance. The deliberate division of interest between the acquiring of new and the applying of existing knowledge, between 'pure' and practical research, is seldom in reality as neat as it appears on paper. All knowledge is potentially useful, and it is often impossible to draw a line across the field of research and say what is fundamental work and what is not. The decision that a discovery is fundamental is as a rule a retrospective judgement. Because of this difficulty of defining fundamental research in advance, the support of research is risky: the gamble is not so much on the results as on their significance. Nevertheless, there is more than artificial and administrative convenience in the Foundation's wish to support separately, on the one hand, the kind of research which is likely to yield new knowledge of a fundamental nature, and on the other, the attempt to focus existing knowledge for the elucidation of some problems of the present.

The Foundation's first quinquennial programme was inevitably tinged with concern for some of the more immediate post-war requirements of teaching and research in the United Kingdom and especially for the urgency of enabling academic studies to be restarted and restaffed on a scale sufficiently attractive to win back the research workers who had tasted the lavishness of officially-backed wartime research. It was also important to help in securing that universities in Britain would be able to offer the fullest opportunities especially to postgraduate students from the Commonwealth. Hence the Foundation's grants were confined to research in this country.

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But it was always in mind that presently both public and other private support of research in Great Britain would enable the Foundation to release a proportion of its resources for expenditure on research in oversea parts of the British Commonwealth—where the amount of research at present being undertaken falls short of the great potentialities, and where the funds available in support are so very small.

The Foundation has thought it right to consider the possibility of encouraging research in some of the Dominion universities and associated institutions—all the more because, in the developing societies and resources of the British Commonwealth, universities have a proper and important role to play. Not only have they to train professional and technical leaders: as the creators and custodians of learning they have to guide and guard the characteristic way of life and thought of the societies which they serve and which they help to mould. This is a difficult task which is beginning to fall also upon the university colleges of the colonies, though necessarily on a lower and longer-term basis. For such work, recognition and encouragement from this country are essential. The strengthening of academic links throughout the Commonwealth—important as that is for its own sake—may well affect the growth and spread of all those other activities in which Britain should be lending its great and greatly desired influence. In intellectual as in other enterprises Britain has no need to abdicate its proper precedence.

In view of the vastness of the Commonwealth and of the many claims upon the Foundation's resources, the help which the Foundation will be able to offer for research overseas is bound to be highly selective and very limited in amount. In the difficult—often invidious—task of selecting the openings overseas the Foundation will be guided by its advisory committees in the Dominions; these committees have already given invaluable aid to the Foundation in operating its various

travelling-fellowships schemes. Indeed, in all its activities the Foundation recalls with gratitude the help and advice given in a variety of ways by its many friends and advisors, in this country and in the Dominions, and by the members of the departments of government and of universities.

Grants promised during this first year of the Foundation's second quinquennium amount to £506,925, and to meet them a total of £377,425 has been allocated from the year's income; in addition, previously promised grants to a total of £135,000 are to be met, making a total allocation of £512,425 for the year. Although most of its grants are payable over a period, the Foundation prefers as far as possible to fund them, so that the income of subsequent years may be free for new ventures. Of the total allocated, £62,340 has been used for continuing some parts of the programme of the first quinquennium, and £38,735 for research in rheumatism from the Oliver Bird Fund (grants of a further £31,500 have been promised, making £70,235 in all for rheumatism). For fundamental research £46,750 has so far been devoted to biological and £33,000 to sociological studies, and £25,000 has been promised for the first grant for research overseas within the Commonwealth. During the year only one initial step has been taken towards the investigation of a practical problem, at a cost of up to £2,000. Towards the cost of the schemes of fellowships, scholarships, and similar awards to be operated over the whole five-year period a sum of £225,300 has been taken from this year's income, leaving £173,000 to be met from the remaining years; this allocation includes reserves for schemes that have not yet been announced. £60,000 is to be paid as the remainder of the Foundation's promised share in supporting the National Corporation for the Care of Old People; and grants totalling £19,300 have been made for miscellaneous projects outside the particular programme but within the wider purposes of the Foundation.

Continuation of Past Programme

ALTHOUGH the major portion of its resources have been allocated to the various aspects of the programme for its current quinquennium, the Foundation has reserved a sum for continuing or pursuing further a few of the policies developed in the first quinquennial programme. During the past year grants from this reserve have been used to support five projects in the medical sciences, three in the natural sciences, and one in the social sciences. The medical projects continue the Foundation's interest in the definition of normal health and in research in the medico-social field. In the natural sciences and the social sciences the grants are for extensions, large or small, of work already supported in the past.

In addition to these grants to round off or fulfil earlier policies, the Foundation has accepted a continuing commitment to foster research in chronic rheumatism. Fortunately, because of the Foundation's early interest in these problems and because of the generous additional endowment from Captain Oliver Bird, M.C., the Foundation has been well placed to make its contribution to chemical, physical, and biological research into the new anti-rheumatic substances recently demonstrated in the United States of America.

NEW GRANTS

MEDICAL SCIENCES

Nuffield Institute of Medical Research, Oxford: radiological research into normal health

One of the Foundation's most fruitful grants during the first quinquennium was made to support the late Dr. A. E. Barclay's work in the team, headed by Dr. Trueta, which demonstrated the short-circuit in the blood-supply of the kidney.

This discovery—which opened up a new conception of the blood-supply of organs and tissues—was made by means of X-ray cinematography. The Institute, under its present director, Dr. G. S. Dawes, D.M., plans—as part of its programme of researches—to extend the use of X-ray cinematography, initiated by Dr. Barclay, to a study of the circulations of the liver (by Dr. P. M. Daniel, M.B., Ch.B., and Miss M. M. L. Pritchard, M.A.) and to work on the normal movements of the duodenum and oesophagus (by Dr. J. W. McLaren, M.R.C.S., D.M.R.E., and Dr. G. M. Ardran, M.D., D.M.R.). The micro-radiographic techniques which Dr. Barclay also developed are to be applied to an investigation of the lymphatic system; by using a low-kilovoltage X-ray plant, with an extremely thin window (so that a high proportion of soft X-ray escape), there may be a reasonable chance of obtaining X-ray pictures of single cells. This study of the lymphatics will be conducted by Dr. R. Barer, M.C., M.A., M.B., B.S. The Foundation has made a new grant, of £2,000 in the first instance, to the Institute for this work; £800 is for capital expenditure on equipment and £600 a year is to meet the current cost of the research for two years.

The Queen's University, Belfast, Department of Social and Preventive Medicine: health in the linen industry

Because the study and promotion of occupational health is one of the strongest arms of social medicine the Foundation welcomed the early opportunities which it found to initiate—in England and Scotland—university departments of industrial and occupational health in close association with local industries. The creation by the Queen's University, Belfast, of a department of social and preventive medicine, under Professor A. C. Stevenson, B.Sc., M.D., M.R.C.P., D.P.H., has now enabled the Foundation to support, by a grant of £900, an inquiry into health in the linen industry in Northern Ireland.

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Among the problems to be studied under this grant are weavers' deafness, mill fever, and the possible relationship of 'retting' (rotting in the flax dams) to Weill's disease; in addition a few mills are now co-operating in a sickness-records inquiry so as to provide the first industrial morbidity figures collected in Northern Ireland.

Joint Committee of the Royal College of Obstetricians and Gynaecologists, the Population Investigation Committee, and the Institute of Child Health (University of London): second follow-up of children born in 1946

In 1946 support was given to a medical and social investigation of all births occurring in Great Britain during the week 3rd-9th March of that year, and the results were published in book form under the title *Maternity in Great Britain* (Oxford University Press); two years later, in 1948, the Foundation financed a follow-up study of the same children so as to begin the history of their subsequent health and development. This first follow-up was remarkably successful in that only 0.7 per cent. of the original 1,400 babies remained untraced and only 1 per cent. of mothers of the remainder refused information; among interesting results obtained were the first figures for the national incidence of infectious and other diseases in the first two years of life (many diseases escape official notification), a marked social-class difference in body-weight (working-class children were smaller and lighter than children of well-to-do parents), and a great improvement in housing conditions of families between 1946 and 1948. A specially intensive study was made of those children in the sample who had been premature babies, to discover what (if any) mental and physical retardation is associated with premature birth: so far it appears that they are retarded only to the extent that they were born before term.

The success of this first follow-up has encouraged the

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Foundation to make a further grant of £6,000 to enable the Joint Committee to repeat the follow-up in March 1950, when the children will be four years old. Thereafter the children will become the responsibility of the school medical service, and it is to be hoped that means will be found (through the Ministry of Education) to follow them during their school years, up to puberty and adolescence—not only for the sake of completing a unique and continuous record of information about this sample of growing children, but also as a review of the effectiveness of the country's social-welfare and health services.

Institutes of Child Health and of Education, University of London: study of child-development

As a final contribution of this kind to the study of child-health the Foundation has agreed to offer a grant of £3,000 over two years towards the budget for a child-development study conducted jointly by the two Institutes. A pilot survey of twenty-five to thirty children is being made to explore and test methods of collecting and recording physical and mental data; thereafter the full-scale survey will be planned and followed out over a long term of years, and financed from normal university sources. As the survey will start with mothers attending a local ante-natal clinic it is expected that the main value of the study will lie in its genetic approach, and in the opportunity it will provide for observing the same child at successive stages of development, and comparing individual rates and patterns of growth, both physical and mental, in the light of each child's family background and personal experience.

University of Sheffield, Department of Social and Industrial Medicine: nutritional survey of old people living on their own

To follow upon a recent survey of 1,600 old people in

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Sheffield, carried out by the Sheffield Council of Social Service, the university department of social and industrial medicine under Professor W. Hobson, B.Sc., M.D., D.P.H., wished to examine the nutritional state of a sample of the old people living alone or on their own, since the nutritional problems of this group are particularly important. The Ministry of Health was willing to undertake the dietetic part of the survey in conjunction with a clinical and (where necessary) specialist examination conducted by the department in close co-operation with the general practitioners. The Foundation has made a grant of £1,000 to meet the expenses of the survey.

NATURAL SCIENCES

University of London, Birkbeck College, Biomolecular Research Laboratory

Because of the unpredictable expenditure involved in establishing this experimental laboratory, under Professor J. D. Bernal, F.R.S., the Foundation has agreed to terminate its original grant at the end of the fourth year and to substitute a new grant of £32,000 over a further period of three years ending in 1952. By that time it is hoped that more permanent sources of funds will be available for the continuation of the research. An additional reason for extending the Foundation's interest in the work of X-ray analysis of crystals is that it is likely to lead to results of significance in biochemistry and in general biology, so coinciding with one of the Foundation's main interests for the current quinquennial programme.

The biomolecular work is conducted under Dr. C. H. Carlisle, M.Sc., D.Phil. The studies envisaged for the next three years can be broadly divided into two parts: the investigation of the structure-types of the simpler compounds of biological importance, including those that might throw any light on protein and virus structure; and the systematic investigations

both of the low-molecular-weight crystalline proteins and of crystalline viruses. Cutting across these two arbitrary divisions there will naturally arise any studies (like that of crystalline inclusion bodies) as may be directly connected with living tissues, and also problems of biophysical interest which may be handled by crystallographic methods.

The efforts of the electronics department of the laboratory under Dr. W. Ehrenberg, Ph.D., are concentrated about two focal points, namely the improvement of electronic and associated techniques, and the investigation of the electronic properties of dielectrics and semi-conductors.

A third section which has recently been developed is that of electronic computing, under the direction of Dr. A. D. Booth, B.Sc., Ph.D. The object is to reduce the time taken for the very laborious computations needed for crystal structures and to make possible computing of protein and virus work which could not be carried out at all by existing methods.

University of London, University College, Department of Anatomy: physiology of learning

For additional work, arising indirectly out of research under Professor J. Z. Young, F.R.S., into the physiology of learning which the Foundation has been financing, an extra grant of £370 a year for two years has been made for a worker to be engaged on counting and measuring the numbers and densities of cells in the brain. Methods have been devised by which accurate estimates can be obtained that will describe the structure of the brain in terms that may have some significance for function.

British Agricultural Policy: scientific study-group

The Foundation has been supporting an inquiry into the fundamental principles that should be applied in shaping agricultural policy for this country; an analysis and balancing

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of the factors involved requires consideration of questions of food-supply and nutrition, of available labour and capital, and of national defence and international relations. The inquiry is being conducted by Mr. T. E. Eastwood, B.Sc., and Mr. M. P. Fogarty, M.A., and is guided by a group of farmers, economists, and scientists. For the expenses of the current year the Foundation has set aside £3,000.

SOCIAL SCIENCES

Third Statistical Account of Scotland

The four pilot surveys made by the four Scottish universities and co-ordinated by the Scottish Council of Social Service have been completed, and it is hoped that some of these surveys will be published in time for the Festival of Britain in 1951. To the Foundation's two-year grant towards the cost of making the pilot surveys a further grant of £2,000 over three years has been added to keep in being the central organization of the survey while arrangements are being made for completing the full survey in the light of the experience gained from the pilot inquiry.

Already considerable progress has been made in securing accounts for 740 parishes in the areas of Scotland not covered by the four pilot surveys. As was the case in the previous accounts, 100 and 150 years ago, the main authors are the parish ministers of the Church of Scotland, but in a few cases the work is being undertaken by schoolmasters and others with local knowledge.

OLIVER BIRD FUND

The discovery that rheumatism—hitherto regarded by most physicians as a progressive disease, though one subject sometimes to unaccountable 'cures' or remissions—can be immediately halted and reversed by an increase in the amount

of 'cortisone' in the body was announced to the world in April 1949 by workers at the Mayo Clinic, Rochester, U.S.A.

'Cortisone' is the convenient name now given by its discoverer, Dr. Edward C. Kendall, to one of the steroid substances produced as a hormone by the adrenal cortex, which is part of the adrenal gland. So minute is the amount present in the gland that, when Dr. Kendall first isolated it, in 1935, it was impossible to obtain sufficient for tests to discover fully its function and effect in the body. But by 1938 Dr. Kendall and others had succeeded in analysing it; and, after more than eight years of further research, it became possible to produce—by an extremely long, difficult, and expensive technique of partial synthesis, starting from ox-bile—an elaborate steroid compound identical in chemical structure with the natural secretion. By 1948 sufficient of the synthetic 'compound E' could be produced to enable a small beginning to be made in testing this triumphal *tour de force* of chemistry. In the autumn of 1948 Dr. Kendall's colleague in the Mayo Clinic, Dr. Philip S. Hench, decided to try injecting some compound E into a patient suffering from rheumatoid arthritis. For many years—since 1929—Dr. Hench had been studying the beneficial effect of jaundice and pregnancy on rheumatic disease, and trying to find the biochemical denominator, common to these conditions, which relieves rheumatism. He had also observed that after any surgical operation rheumatism frequently improves for a time, and he conjectured that an adrenal hormone might be the clue, since pregnancy and surgery both stimulate the activity of the adrenal gland.

The adreno-corticotropic hormone (ACTH) is a product of the anterior pituitary gland and it governs secretion by the adrenal gland of cortical steroids, including natural cortisone. Its chemical structure is not known, but supplies of ACTH can be isolated, in a form more or less pure and active, from the pituitary glands of animals (pigs are chiefly used). This

hormone was first tried by Professor George Thorn and his colleagues at the Harvard Medical School as a test in Addison's disease (which results from destruction of part of the adrenal gland).

At the Seventh International Congress on Rheumatic Diseases, held last summer in New York, dramatic demonstrations were given of the control of rheumatic disease by an increase of cortisone—an increase produced *either* directly by injecting cortisone manufactured by partial synthesis *or* indirectly by injecting ACTH to stimulate the adrenal gland to secrete more of its own natural cortisone. This development would have been important enough, despite the fact that the new substances are rare and exceedingly expensive, and have apparently to be injected continuously (like insulin in diabetes) if the patient is not to relapse into crippledom—and despite some dangerous other effects beside the beneficial effect on the rheumatic condition. But the news that what were at first regarded as anti-rheumatic substances had an immediate and almost as striking effect also in a variety of other diseases, acute and chronic, opened up far wider possibilities and implications of something quite new and fundamental in medicine and therapeutics. What has occurred is not the end of rheumatism but the beginning of new developments in the science of endocrinology.

The publicity given to these first discoveries was natural, but in some ways regrettable; for until similar but simpler substances can be developed no more than a handful of patients in America can be treated—and fewer still in this country, which lacks the large numbers of cattle and pigs needed to produce even the present small quantities available in America. Already, however, vegetable sources (alternatives to animal bile-acids as the starting-point for the partial synthesis of cortisone) have been found to give a slightly shorter route for making cortisone; and the complex protein

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molecule of ACTH has been broken down into a smaller substance with an enhanced effect, though its exact chemical composition—and so the chances of synthesizing it—are not yet known. Meanwhile no one knows how cortisone works; but it remains the most hopeful weapon yet thrust in the hands of medical science for investigating the cause, and so perhaps the cure or prevention, of rheumatism and of any other diseases that may be shown to share the same mechanism.

The Foundation's grants for research in rheumatism made during the past year are set out below. The grants conform to a programme: on the chemical side the Foundation is financing the difficult search for alternative ways of making cortisone or for alternative substances with the same effect, as well as an attempt to find and synthesize the active element in ACTH; and on the clinical side steps are being taken—in tissues, for example, where the full battery of physical research is being concentrated on discovering their structure in health and disease—to study the changes that take place when these new substances are administered, so as to discover *how* they work. For this group of projects a total of £48,800 has been allocated to date. A further £8,825 have been granted during the year for other investigations into rheumatism.

Because of the wide horizons opened up for medical research by the new substances, the Medical Research Council is naturally interested and implicated. So that no unnecessary duplication of effort and no neglect of possible lines should occur, the closest liaison is being maintained between the Medical Research Council and the Foundation; and the two bodies jointly have approached the representatives of the pharmaceutical industry in this country with a view to even wider collaboration by pooling the results of commercial and academic research upon the problems presented by cortisone and ACTH.

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RESEARCH ON CORTISONE, ACTH, AND SIMILAR SUBSTANCES

University of Cambridge, School of Biochemistry

A grant from the Foundation of £1,000 for additional apparatus and £10,000 over three years for an additional research worker (Mr. M. Stack-Dunne, B.Sc.) and technical assistants and for materials has been accepted by the university for work under the direction of Professor F. G. Young, D.Sc., F.R.S., Sir William Dunn professor of biochemistry, on pituitary adreno-corticotropic hormone (ACTH). After the isolation of ACTH and its purification—and with the help also of some commercial supplies—the fission of the material into peptides will be investigated; once the biological activity of the peptides has been established, their composition and structure will be studied by all methods and especially by those developed in the department. An attempt to synthesize the peptide structure will then be made, both in this department by Dr. Legett Bailey, B.Sc., Ph.D., and in the department of chemistry under Professor Todd.

University of Cambridge, University Chemical Laboratory

The University of Cambridge has also accepted the Foundation's offer of £5,000 over three years to assist research by Professor A. R. Todd, M.A., F.R.S., professor of organic chemistry, and Dr. G. W. Kenner, M.Sc., Ph.D., into methods of convenient synthesis of peptides, and particularly of biologically active peptides related to ACTH. The grant is to be used for an additional research worker, technical assistance, and materials. The work will be closely integrated with that of the department of biochemistry under Professor Young. In addition Dr. A. J. Birch, M.Sc., D.Phil., is attempting to synthesize compounds with cortisone-like activity but

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simplified structure, first by finding out what kinds of simplifications are possible without abolishing activity; this work is pertinent to that being undertaken at Oxford under Professor Sir Robert Robinson.

University of Oxford, Dyson Perrins Laboratory

A grant of £10,000 for three years, for two senior and two other research assistants and for apparatus and materials, has been accepted from the Foundation by the university for a project for the partial or even total synthesis of cortisone and analogous substances. The project is being directed by Sir Robert Robinson, O.M., M.A., LL.D., D.Sc., P.R.S., Waynflete professor of chemistry. Among work intended or in hand are: two syntheses of cholesterol, which have an indirect bearing on cortisone; a determined effort to see whether tricyclic and tetracyclic intermediates could be used for transformation into active compounds; and work on androgen analogues of cortisone, which might be extended to cortisone analogues. By following these and other routes to substances that may provide near analogues of cortisone, it is hoped that the lines of direct total synthesis may gradually emerge.

Royal Technical College, Glasgow, School of Chemistry

To enable Professor F. S. Spring, D.Sc., F.R.I.C., to retain two research workers, for an investigation of materials other than bile-acids as a source of cortisone-like substances, the Foundation has made available £1,100 a year for two years. The programme includes an investigation of ergosterol derivatives and a search for suitable sapogenins (in addition to materials available in this country, it is hoped to obtain and grow wild yam and related plants); but routes to cortisone and similar compounds from a bile-acid source are also to be pursued.

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University of Manchester, Rheumatism Research Centre

To assay the activity of the new anti-rheumatic substances, cortisone and ACTH, and any analogous or simpler substances that may be developed by chemical research, elaborate tests on patients suffering from rheumatic disease are necessary. Not only have the clinico-physiological data closely related to the rheumatic process to be observed, but the profound effect of substances such as cortisone and ACTH on other bodily functions not directly related to rheumatic disease have to be closely studied; all this requires elaborate team-work and much technical assistance. The Foundation has therefore provided £800 a year for three years for two additional technicians, and for extra films for recording; £1,000 a year is also reserved for an additional whole-time clinical assistant if provision is not made by the hospital board.

The Rheumatism Research Centre, under Dr. J. H. Kellgren, F.R.C.S., is also collaborating with Professor Astbury's department of biomolecular structure at Leeds in an examination of tissue-changes in rheumatoid arthritis. At Manchester suitable biopsy material is collected from lesions photographed at the time of operation and is studied by histological and special histochemical techniques and then passed on for further analysis at Leeds. For additional apparatus for the histochemical studies the Foundation made a £200 grant.

University of Leeds, Department of Biomolecular Structure

For some time the department under Professor W. T. Astbury, M.A., Sc.D., F.R.S., has been at work on the examination of normal and pathological collagen and related tissues in general, by X-ray analysis, the electron microscope, infra-red, and other techniques. It is now proposed to subject to this intensive examination arthritis lesions supplied by the Rheumatism Research Centre, Manchester. On the supposition that the rheumatic diseases issue finally in a fundamental

disturbance of the metabolism of collagenous and related substances, the aim will be to try to characterize the fine-structural changes down, if possible, to the molecular level; in particular, it is hoped to study what happens to the tissues after the dramatic alleviation produced by cortisone, ACTH, and other similar substances evolved in the course of research now being supported by the Foundation in chemical laboratories. The Foundation has made a grant of £5,000 over three years, and the grant is being used to strengthen the department for this collaborative work by the addition of a biophysical chemist and by the acquisition of extra apparatus. Presently one of the reflecting microscopes being produced under the Foundation's grant to the University of Bristol will be used to investigate these problems.

St. Mary's Hospital Medical School, Department of Medicine

Since the effect of cortisone and ACTH is not confined to the rheumatic diseases, the study of the action of these substances is relevant to many other disease-processes. For this reason the medical school decided to set up, within the department of general medicine under Professor G. W. Pickering, M.D., F.R.C.P., a research unit for the study of these new substances in rheumatism and other diseases; the unit will have the collaboration, as required, of the departments of pathology, physiology, orthopaedics, and radiology; and—if, as is likely, new light can be thrown on the whole problem of immunity and allergy and their part in disease—the collaboration of the Wright-Fleming Institute under Sir Alexander Fleming and Professor R. Cruickshank will be particularly valuable. To enable this research unit to start its studies the Foundation is supporting it for five years with a grant totalling £10,000 for the salary of a research assistant to work under Professor Pickering and for secretarial and technical assistance. The actions of cortisone and ACTH will be studied, as broadly as

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possible, on various disease-states; these studies will almost certainly suggest particular experiments to show in what way the substances are acting and why the disease-processes on which they act arise in certain individuals.

OTHER RESEARCH IN RHEUMATISM

Clinical investigation of various treatments

Last year the Foundation reported three grants made, as a start, to finance extra medical, clerical, and technical assistance for clinical trials and follow-up investigations at centres qualified for this kind of scientifically controlled study of different methods of treatment and relief. Two of the grants (made for a year in the first instance) were to assist therapeutic trials in the rheumatic unit under Dr. J. J. Duthie, M.B., Ch.B., M.R.C.P.E., at the *Department of Medicine, University of Edinburgh*, and by Dr. H. S. Barber, M.A., M.D., M.R.C.P., in two of the hospitals controlled by the *Manchester Regional Hospital Board*. The third was for a six-month's pilot follow-up of a sample of patients investigated and treated since 1939 by the rheumatism unit in the charge of Dr. E. G. L. Bywaters, M.B., B.S., F.R.C.P., at the *British Postgraduate Medical School, University of London*. This sample follow-up was considered sufficiently successful, both in the large proportion of ex-patients traced and in the value of the data collected, for a complete follow-up to be initiated; accordingly, a continuance of the grant of £875 for a further six months has been decided, and further renewal up to a total of two years will be considered so that all the 350 patients treated in the last ten years can be re-examined.

During the last year two more grants have been made. First, to the *South-West and Oxford Regional Research Unit, Bath*, under the supervision of Dr. G. D. Kersley, M.D., F.R.C.P., a grant of £1,600 has been offered, for a year in the first instance, to cover the salary of a senior registrar (Dr.

CONTINUATION OF PAST PROGRAMME

M. H. L. Desmarais, M.R.C.S., L.R.C.P.) and for additional laboratory and clerical assistance. With the help of this grant, a controlled follow-up of the effect of various dosages of deep X-ray therapy in a sample of spondylitic, osteoarthritic, and rheumatoid cases is being initiated, and also the effects of different intra-articular injections in osteoarthritis are to be assessed.

Secondly, a grant has been made to the *Orthopaedic and Accident Department, The London Hospital*, where Mr. W. Alexander Law, O.B.E., M.D., F.R.C.S., has long been engaged in the surgery of chronic arthritis. The hospital has accepted £1,250 to enable Mr. Law to conduct controlled research into arthroplasty of the knee-joint and follow-up studies of the results of vitallium-mould arthroplasty in hip-joint disease and of spinal osteotomy in severe rigid kyphosis; the grant is being used to finance secretarial and photographic help for the recording of clinical findings. The interest of the research will lie not only in the perfecting of surgical techniques but also in determining the stage at which surgical intervention is most effective.

Other grants

For a one-year investigation by Dr. M. I. P. Wilkinson, M.A., B.M., B.Ch., M.R.C.P., into the cause of chronic rheumatic pains in the upper limbs and neck the Foundation made a grant of £500 to the *London Hospital Medical College*; the work has been done in the Bernhard Baron Institute of Pathology under Professor Dorothy Russell and the neurological department under Dr. W. Russell Brain.

During the past three years there has been established, in the *Department of Anatomy, University of St. Andrews*, under Professor R. Walmsley, M.D., F.R.S.E., the nucleus of a research unit for the investigation of joints. It is the belief of the members of the department that, by the extension of existing

knowledge on the form and function of joints and by observations on the reaction of normal joint-tissues to various forms of injury or upset in joint-mechanism, a further understanding of the causes of certain forms of osteoarthritis may be obtained. To supplement the sums made available by the university for this work the Foundation has offered £1,000 for capital equipment and £1,000 a year for two years for extra staff. The university, in accepting the offer, has indicated that, if promising results are obtained in the two years, additional finance to carry on the work will be provided from university sources.

At present physical agents (electric, radiant, and supersonic) for the diagnosis and treatment of rheumatic diseases are used empirically, since no methods of measuring quantities and defining units exist; accurate prescribing of dosage is therefore impossible. Again, little is known about the penetration of heat or about techniques for getting heat-treatment deeper into the tissues. To enable Dr. P. Bauwens, M.R.C.S., L.R.C.P., who is a physicist as well as the physician in charge of the *Department of Physical Medicine, St. Thomas' Hospital*, to engage an additional electronic technician and purchase additional apparatus for research in these two aspects of non-ionizing radiation, a grant of £800 a year for two years has been accepted by the hospital.

Fundamental Research

IT is towards fundamental research, especially but not exclusively in biology and in sociological studies, that the Foundation hopes in the current quinquennium to be able to give the major part of its support. But some part of its resources is reserved for helping the very exceptional person or project in any branch of the medical, natural, or social sciences; and for the first time the Foundation is prepared to consider grants—which must of necessity at first be few and highly selected—to universities and similar institutions in the Dominions and Colonies if unique or specially promising facilities and opportunities exist there for research by workers of high ability.

In biological studies the Foundation's main aim is to seek out and support work in the normal mechanisms of growth, differentiation, and self-maintenance of living organisms. Although the investigation of these mechanisms needs the concerted help of the chemist and the physicist, the approach needs to be essentially biological: for example, it is not sufficient to identify the chemical constituents of living things without seeking also to answer how and why these substances work as they do. A tremendous impetus has been given, of recent years, to the study of chemotherapeutic agents (sulpha drugs, penicillin, and others), and the famous successes achieved have tended to distract attention from our ignorance of the fundamentals of immunology. Similarly the fundamental processes of heredity, of differentiation, and of development are still relatively little understood. It is for these reasons that the Foundation will seek to support studies of living organisms and their vital processes; for it is only by a better understanding of nature's normal workings that intelligent intervention becomes possible.

Just as there is an understandable tendency to concentrate on acute disease rather than immunology, so social studies tend to be asked to deal principally with society when it breaks down rather than with the reasons for normal functioning. That there are frequent gaps in our elementary knowledge of the springs of ordinary human behaviour, matters considerably now that the state is attempting to plan consciously for social happiness. To take only one example: the new towns will probably cost something of the order of £400 million, but (as Professor David Glass pointed out in his inaugural lecture as professor of sociology in the University of London) the only apparent research carried out to establish the optimum size of towns was an analysis of correspondence reaching the BBC after a radio discussion on new towns. Although the Foundation would like to stimulate inquiries into the normal functioning of society and of man in relation to society, planned selection of projects is difficult in the present condition of the social sciences. Hence the Foundation will take such opportunities as offer for strengthening sociological research, both in university and in non-university institutions, and for encouraging the various attempts which are being made to associate the divergent and often disparate disciplines in the search for new knowledge.

The fact that the Foundation has chosen, within the field of fundamental research, to look specially for chances of advancing studies in two subjects, biology and sociology, which are at present comparatively neglected has one further implication. Just because biology, as compared with physical and chemical research in recent years, has not advanced so far; and because sociological studies are neither so highly organized nor so powerfully established as economics, there may be opportunities of applying to these two fields some of the techniques successfully developed in the more advanced

fields of research. The Foundation will therefore be especially interested in schemes to extend the application of known or new techniques and other aids for dealing with biological and sociological problems.

GRANTS IN THE UNITED KINGDOM

BIOLOGICAL RESEARCH

University of London, King's College, Department of Zoology

Every cell is made up of a nucleus and of surrounding cytoplasm, but the nature of the interaction of the nucleus and the cytoplasm is at present little understood. It is disputed which is responsible for the differences between cell-types (for example, which determines that a cell shall become skin rather than, say, bone, and what makes skin-cells go on making more skin-cells). In the hope of obtaining decisive evidence on this aspect of differentiation, the department of zoology under Professor J. F. Danielli, D.Sc., A.R.I.C., is experimenting with techniques for transplanting the nucleus from one type of cell into another type of cell. The effect of these transplantations upon the shape, growth, and chemical organization of the cell will then be studied, to discover whether it is the nucleus or the cytoplasm that is the prime controller of the cell's characteristics. The study of the chemical morphology of the cells will be attempted by new cytochemical methods of 'labelling' proteins in the cytoplasm by building into them substances that can be identified and followed by their light-absorbing or electron-scattering properties—rather as radio-active isotopes are used to trace and localize substances.

For this study of differentiation—by nuclear and cytoplasmic transplantation, and by cytochemical methods—the Foundation has offered a grant of £8,250 over five years.

University of London, University College, Department of Anatomy

One of the chief requirements for the proper control of nervous diseases is a better understanding of how the nervous system is made up and of what it does. At present the pathologist and clinician still work very nearly in the dark because the nature of the whole complex machine is not clear, especially in its more elaborate parts. The Foundation has already made a grant to the department of anatomy under Professor J. Z. Young, M.A., F.R.S., for a start upon the comparative study of different types of learning-system, beginning with the octopus: the part of the brain responsible for learning by this animal has now been found and many of its properties can be described. Now that this tissue has been identified, further investigations of its electrical and chemical characteristics become possible, and work on the nervous system of other animals is needed for comparison. The possibility of using the ideas of electronic engineers, both to provide technical methods for the study of the nervous system and to help with analysis of how the brain works, is also to be tried; for example, it is possible that electronics may revolutionize the present primitive methods of counting and measuring cells in microscopic examination. The Foundation has made grants totalling £10,000 for a five-year continuation of the research into the physiology of learning and for the addition of an electronic engineer to the department.

University of London, University College, Department of Embryology

Two main problems that confront the study of development are the control of regional determination at early stages of development and the factors controlling the migration of cells. These are being investigated by Mr. M. Abercrombie, M.A., B.Sc., in the department of embryology, at present directed by Professor G. R. de Beer, M.A., D.Sc., F.R.S.; since

progress in this field is difficult to foretell, the Foundation is supporting the work by a grant, of £500 a year for three years in the first place, to enable a graduate assistant to be engaged to help the research workers in the department. The first problem will be investigated by transplantations from different regions of duck embryos 'marked' with radio-isotopes into different regions of non-radioactive embryos, and vice versa, and then studying the progress of the grafts by radio-autographs. The second problem will be studied in tissue culture, and is important not only in the early and later stages of development—when mass migrations of cells take place—but also in adult regeneration, hypertrophy, and wound-healing.

University of Oxford, Laboratory of Chemical Crystallography

Detailed X-ray analysis of crystals of complex compounds of importance in biology and medicine has been yielding information about the position of the atoms within the crystals. The atomic positions found establish in turn the chemical and stereochemical structures of the molecules investigated; they also show the way in which the molecules pack together in the crystals, which may have an important bearing on their behaviour and action in the body. Among compounds successfully analysed during the last few years by research workers under Mrs. Dorothy Crowfoot-Hodgkin, B.Sc., M.A., F.R.S., in the laboratory of chemical crystallography at Oxford, have been organic molecules of molecular weights between 300 and 600—such as cholesteryl iodide, calciferol, and penicillin; much more complex compounds, varying in molecular weight from 12,000 for insulin to 1,500,000 for the tobacco necrosis protein, have been examined, though full analysis is beyond practical bounds. Mrs. Hodgkin is anxious to press X-ray analytical methods to their limit, and to attempt now the detailed analysis of compounds

beyond the present limit (of about molecular weight 600) and up to about 1,600; this would include vitamin B₁₂, the anti-pernicious-anaemia factor, which has a molecular weight of about 1,500 and probably about 100 atoms, not counting hydrogen, in the molecule. The analysis of compounds of this size, however, presents considerable problems, and judging by the work on penicillin the analysis of even one compound is likely to require several years and an immense labour of computation. The university has accepted from the Foundation a grant of £15,000 to form for five years a small research unit under Mrs. Crowfoot-Hodgkin, equipped with calculating machinery and computing assistance.

Strangeways Research Laboratory, Cambridge

The late Dr. T. S. P. Strangeways wished to conduct his research in complete freedom from both university and government control, and the institution which he founded with the help of private benefactions has continued as an independent venture. It began in 1905 as the Cambridge Research Hospital and was converted into experimental laboratories when Dr. Strangeways became convinced that fundamental knowledge of the processes of normal growth was an essential condition of progress in investigating disease. The laboratory is devoted to the study of cell biology and, under the direction since 1928 of Dr. Honor Fell, D.Sc., Ph.D., has sustained its remarkable output of original work; as Dr. Strangeways's principal collaborator, Dr. Fell has used and advanced the method of tissue culture, by which small fragments of living tissue can be isolated in glass vessels and made to grow and develop outside the body in a nutritive medium, sometimes for long periods. By this means human and animal cells can be observed alive under the highest magnification: optical advances during the past few years have made it possible to see the fine structure of individual living cells with

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astonishing clarity, and, by combining these microscopical techniques with cinematography, intricate cellular processes can be analysed in great detail. These investigations are now being correlated with others on the chemistry of the cell, with the object of providing information about chemical events within the dividing cell. The trustees of the laboratory have accepted from the Foundation a grant of £12,000, to be expended in the next five years on new optical and laboratory apparatus and materials and on technical assistance, for a programme of research on the structure and physiology of living cells, with special reference to the problems of cell division, and experimental investigations into the intricate processes of cellular differentiation.

SOCIOLOGICAL RESEARCH

University of Aberdeen, Department of Economics

The falling birth-rate of the last thirty years has emphasized the importance of the economic and social disabilities imposed on families with young children. Inquiries made between the wars demonstrated how close was the correlation between poverty and the number of children, a demonstration which led eventually to the family allowance introduced after the war. The recent Royal Commission on Population recommended further measures to ease the economic burden of rearing children. But little further research has been done into the effects of our new social policies upon family costs; nor has the official cost-of-living index, based on an 'average' family of $3\frac{3}{4}$ people of whom only one is a child under 14 years, borne much relation to those in the early stages of founding and bringing up the next generation. To study the domestic expenses of young families the department of economics under Professor Henry Hamilton, M.A., D.Litt., has designed an inquiry in Aberdeen into the budgets of young

childless couples, married couples having their first child, and married couples having their second baby. To finance this inquiry, which will take three years, the Foundation has provided £6,000. Families of up to two children are representative of the vast majority of families in this country, and an attempt will be made to choose a sample from all economic and social classes. The study of the changes in the pattern of expenditure which follows the arrival of the first and second child will thus throw light on a vitally important but neglected aspect of our social life. The inquiry is linked with an investigation being undertaken by the midwifery department of the university, in conjunction with the social medicine unit of the Medical Research Council, into the efficiency of human reproduction and effects thereon of social, economic, and nutritional influences.

Family Welfare Association and Tavistock Institute of Human Relations

When the Charity Organization Society (as the Family Welfare Association was then known) was started in 1869, its founders set out to replace indiscriminate charity—with which benevolent individuals and private bodies supplemented the inadequate relief given by statutory boards—by constructive help based on the careful study of each individual problem; this family case-work has remained the basis of its activities. But the problems have become very different, and the Family Welfare Association like many voluntary social agencies has been faced with the need to develop new techniques of help now that problems of material want have largely given place to problems of personal and community relations. Experience of the stresses and problems of the family has suggested one experiment in the development of a new type of case-work practice—called ‘family discussion bureaux’—which approaches personal problems in the

perspective of community relationships. Two experimental bureaux have been started, in Fulham and Hendon, and some first steps have been taken in a new kind of educational and therapeutic work with the family. But it was soon seen that, if this work was to proceed as a scientifically founded endeavour, systematic research was needed on the development of various patterns of family life and on the relative contribution of individuals and community to these patterns. With the collaboration of the Tavistock Institute of Human Relations, which already has experience of field-studies of family and community relationships—for example in following up the resettlement of repatriated prisoners of war—a study is to be planned of the normal patterns, and the deviations from the norm, of family life. The Foundation has made available over three years a grant of £12,000.

University of London, London School of Economics and Political Science: Division of Research Techniques

The Foundation learnt that the London School of Economics and Political Science proposed to create a new research department, the department of sociological and demographic research, of which the nucleus would be the existing social research division and the independent Population Investigation Committee (both of which the Foundation was already supporting in research), together with a new unit to study and develop techniques of social research. The proposed department's objects include the encouragement of co-ordinated social research and the prosecution of its own research upon a defined plan, so that individual results may be cumulative and so that contributions may be made in those areas of knowledge in which the need for new and objective results is most acute. The Foundation welcomed the School's proposals; and because it wished, as part of its programme for the current quinquennium, to stimulate the study and applica-

tion of new techniques for research, a grant of £10,000 was promised to meet for five years the salaries of the part-time director and of other central staff for the new division. Both existing and new techniques will need to be tested by experimental inquiries, and some field investigations—and possibly some field investigators—may be required, a need which the Foundation has undertaken to consider as it arises. The division has been fortunate in securing for its first director the newly appointed holder of the chair of statistics, Professor M. G. Kendall, M.A., Sc.D., formerly joint assistant general manager and statistician to the Chamber of Shipping. The division's principal concern will be research in the application of statistical techniques to social data and the study of sampling and interviewing techniques. The development of new statistical techniques is urgently required, and the sample interview is one of the most valuable, though perhaps the least validated, of the tools of social research. Since both governmental and commercial agencies rely so largely upon the information obtained by sample investigation it was time for an authoritative attempt, under independent academic auspices, to make the technique more reliable.

Joint mental-survey committee of the Population Investigation Committee and the Scottish Council for Research in Education

Part of the Foundation's general grant in support of research by the Population Investigation Committee was used to finance an inquiry undertaken in 1947, jointly with the Scottish Council for Research in Education, into the trend of intelligence in Scottish schoolchildren. A complete age-group (all the eleven-year-olds) was tested with the identical tests that had been applied to the comparable age-group in 1932. In addition, more detailed information on the social and economic background of the children was obtained for a sample of about 7,000 of these children, and individual tests

were applied to a further random sample of 1,200 of the children. The first volume of the report on this inquiry was published last year under the title *The Trend of Scottish Intelligence* (University of London Press).

The hypothesis that because the less intelligent families tend to have more children the average of the nation's intelligence is falling was not confirmed by the results of this first inquiry. It is important to account for this, and one of the main questions yet to be answered is the relationship between birth-order and intelligence in families of different sizes. The joint committee, under the chairmanship of Professor Sir Godfrey Thomson, D.Sc., D.C.L., Ph.D., is carrying out more detailed investigations into this problem, as well as into many other matters for which the inquiry has now provided information. Further, the committee wishes to follow the careers of the 1,200 sample children, as well as of an additional number of very bright and very dull children, to see what happens in our society to children representative of the whole range of intelligence. It is proposed to follow these 2,000 children for at least twenty years; for the five-year stage till the children reach eighteen years of age the Foundation has made a grant of £5,000.

GRANTS OVERSEAS

Up to now the Foundation has considered it right—and indeed, in view of the many claims upon its resources, inevitable—that it should limit its grant-giving overseas to training fellowships and scholarships, confining its grants for research to the United Kingdom. But from the outset the Foundation has hoped that the time would come when it would be possible to support research in the Dominions, and recently consideration began to be given to this possibility. In addition to the first grant described below, the Foundation

is exploring other ways in which it can begin modestly to forward research work—particularly fundamental research in the biological sciences—in universities and research institutions of the British Commonwealth, especially by attaching from time to time workers from the United Kingdom who may be able to help in the exploitation of specially favourable resources for research.

New South Wales University of Technology: Nuffield Research Chair of Mechanical Engineering

The Foundation has begun to seek opportunities of supporting, especially in the pioneering stages when help is often hard to come by, new projects of research in Dominion universities. For Australia, on the threshold of an industrial development of great significance and hope for Australia's growing status in affairs, it seemed clearly important to find some means of aiding not only research on fundamental problems but also the exploitation of the country's great potential resources. The opportunity arose when the government of New South Wales established the first technical university in the British Commonwealth. The new university will offer undergraduate and postgraduate courses—the former arranged on a part-year basis so that students can combine academic training with practical supervised experience in industry for the remainder of the year—and compulsory courses in languages, literature, human relations, and contemporary civilization will avoid the handicap of narrow specialization.

The endowment of a Nuffield research chair in mechanical engineering, for which the Foundation is providing £25,000 over ten years, was announced at the laying of the foundation-stone of the new University of Technology, a ceremony which Lord Nuffield himself attended. The chair is intended to enable the Nuffield professor to be free from the heavy load

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of responsibility for organizing and conducting teaching and so to concentrate on new developments in the theory and practice of mechanical engineering and on the solution, through the medium of mechanical engineering, of some of the problems obstructing Australia's full economic development.

Research into Practical Problems

THE Foundation's wish to support attempts to apply existing knowledge and techniques to some of the present problems that confront us does not relate to applied research in the usual sense of developing and adapting fundamental discoveries to the stage at which they become applicable in ordinary industrial or other processes. Important though it is that this kind of practical application of new knowledge should be swift, the field is not one to which the resources of private bodies like the Foundation can often or appropriately be applied. For this part of its programme the Foundation envisages rather the kind of approach which sometimes goes by the name of 'operational research' and which sprang to fame by its successes in elucidating, through scientific methods, the hazards and operations of war. That is to say the Foundation has in mind the study, by scientific techniques, of some contemporary problems which are of sufficient moment to attract, for their solution, the willing interest of scientists skilled in a variety of disciplines who are prepared to organize and apply their different skills in combination. This kind of research does indeed go on, under both governmental and industrial or commercial auspices; but not all the problems susceptible to this sort of approach are of 'official' importance, and many are so complex—being, rather, an enormous number of problems all mixed and linked up—that there is need for a new technique in 'combined operations' for their analysis and solution. Whether the problem be a social phenomenon (such as crime) or one of industrial efficiency, or whether it be the better ordering and advancement of an under-developed area in the Empire, a

complete study and a full solution require many quite different kinds of expertise. To attract and train people for this new type of large-scale team work is not likely to be easy, and the Foundation is prepared for some wastage and failures in the search for schemes. Nor is it likely that anything so ambitious will emerge at once; perhaps it is sufficient that the Foundation's willingness to examine projects of this kind should be known and that meanwhile the techniques of co-operative research should be tested on a smaller scale.

GRANT

Investigation of Consistency of Stop-Watch Time Studies

Motion and Time Studies have long been accepted as important aids to simplifying work and assessing its time-value in industrial and other activities in the United States of America, but less confidently in this country, where some scepticism was felt about them in many quarters. In some cases acceptance has preceded agreement on their purpose, methods, and validity. The declared purpose of Motion and Time Studies is to improve efficiency, to satisfy the human and operative needs of workers, and, finally, to establish an objective time-standard for the performance of a particular task. The methods of timing operations and assessing an operator's performance are partly objective and partly subjective. It is generally claimed, however, that in practice they give results which are consistent and correct. Because of the importance of stop-watch time-study technique in industry, the Foundation willingly accepted the idea of sponsoring an independent and disinterested scientific investigation. A steering committee of physiologists, psychologists, statisticians, and experts in management has been formed under the chairmanship of Professor Sir Frederic Bartlett, C.B.E., M.A., F.R.S., professor of experimental psychology in the University of

RESEARCH INTO PRACTICAL PROBLEMS

Cambridge; Mr. Winston Rodgers, B.Sc., M.I.I.A., head of the department of management studies at Acton Technical College, has been invited to direct the project. The first stage will be to devise methods of testing the consistency of the methods practised. As a first step, a 'pilot' investigation is being planned under laboratory conditions to compare the findings of some twenty experienced time-study practitioners drawn from a wide range of industries and set to time the same specially designed operations. The results of this first experiment may serve to determine whether the inquiry should be pursued further, and if so on what lines. For the first stage of the investigation the Foundation has provisionally set aside £2,000.

Fellowships, Scholarships, and Similar Awards

IN considering the desirable range of its fellowships policy for the second quinquennium, the Foundation has been guided both by the experience with schemes instituted in earlier years and by the opportunities offered for reinforcing, by new fellowships schemes, some of the policies being pursued in the other parts of the Foundation's programme for the current quinquennium. During this first year of the new period the principal decisions have concerned those schemes which, either unaltered or in a slightly modified form, are to be continued from the past. Only two entirely new schemes have so far been instituted—travelling fellowships for the Home Civil Service, and travelling scholarships for farmers of Australia, Canada, and New Zealand.

CURRENT SCHEMES

SCHEMES CONTINUING UNCHANGED

Dental fellowships and scholarships

Since this scheme was instituted for the United Kingdom 14 fellowships (and 3 other grants) have been awarded out of 66 applications, and 4 scholarships out of 7 applications.

At the end of the first quinquennium the Foundation recorded disappointment that there had been so few applications from persons who wished to equip themselves for an academic career in dentistry, as the need for training more dental teachers and research workers remains as great as ever. In 1949, however, the response has been encouraging. The scheme continues till 1954.

FELLOWSHIPS, SCHOLARSHIPS, AND SIMILAR AWARDS

Fellowships and scholarships for the advancement of extraction metallurgy

As in previous years, the operation of this scheme, which is open to the whole British Commonwealth, has been highly satisfactory. Since the last report a further 5 fellowships, 1 postgraduate scholarship, and 11 vacation scholarships have been awarded, making a total of 16 fellowships, 16 postgraduate scholarships, and 38 vacation scholarships since the scheme was instituted. It is interesting to record that the postgraduate scholarship awarded in January 1950 was made to a Foundation ex-vacation scholar.

The Foundation originally decided that this scheme should end in 1951, five years after its inauguration. This decision was confirmed in 1949 and it is hoped that—at the instigation of the Institution of Mining and Metallurgy, which has helped the Foundation so much in the past four years—the industry will be able to continue a similar scheme from its own resources.

Dominion travelling fellowships in medicine, the humanities, social sciences, and natural sciences

For the older Dominions of Australia, Canada, New Zealand, and South Africa travelling fellowships for postgraduate study in this country continue to be awarded on the recommendation of local selection committees; for the new Dominions of Ceylon, India, and Pakistan an offer of similar fellowships, in subjects to be selected on the advice of local committees, has been made. When the present fellowships were inaugurated the Foundation stressed the principle that selection should be made on quality and not quantity, and that persons of the highest quality only should be nominated for fellowships. The Foundation wishes to record grateful thanks to the Dominion selection committees for so closely following this principle; to the fellows, who have earned such

FELLOWSHIPS, SCHOLARSHIPS, AND SIMILAR AWARDS
high praise from their directors of study; and to the many persons, in the humanities, social sciences, natural sciences, and medicine who have interested themselves in the fellows' work and guided them in their studies.

Travelling scholarships for Southern Rhodesia farmers

In 1948 the Foundation, as an experiment and in order to assist the training of young farmers of Southern Rhodesia, allotted a sum of money to enable a limited number of scholars to come to the United Kingdom each year to study practical farming. Seven scholars in all were appointed. From them, and from the Rhodesia National Farmers' Union, the Foundation learnt that these scholarships were considered most valuable, and in consequence it has been decided to continue to offer up to two scholarships a year for the rest of the quinquennium.

Panel of medical visitors to the Colonies

The scheme by which the Foundation is financing annually visits to East and West Africa of a panel of unofficial medical consultants operated successfully in 1949. The second year's visits have been completed and for the third year the panel has been chosen. They are: M. H. J. Seddon, D.M., F.R.C.S., director of the Institute of Orthopaedics, London; Dr. Cicely Williams, D.M., M.R.C.P., D.T.M. & H., World Health Organization, Geneva; Dr. N. Lloyd Rusby, M.A., D.M., F.R.C.P., hon. physician and clinical assistant, children's medical and pulmonary tuberculosis departments, St. Thomas' Hospital, London; Professor H. W. Rodgers, O.B.E., F.R.C.S., professor of surgery, The Queen's University, Belfast; Dr. J. H. Peel, M.A., B.M., B.Ch., F.R.C.S., F.R.C.O.G., obstetric and gynaecological surgeon, King's College and Princess Beatrice Hospital, London; Dr. G. I. Scott, M.A., M.B., Ch.B., F.R.C.S., assistant ophthalmic surgeon, Royal Infirmary, Edinburgh.

FELLOWSHIPS, SCHOLARSHIPS, AND SIMILAR AWARDS

Interchange scheme for training of social workers and administrators

To enable the British Committee for the Interchange of Social Workers and Administrators to arrange visits to the U.S.A. and Canada, with a view to effecting an exchange of knowledge and techniques in social work, the Foundation is continuing to make available the balance, of £2,500, remaining from its original grant. During the past year two successful study-visits to the United States and Canada have been made, one by an almoner, who went to study the aftercare of the tubercular, and one by a family welfare worker. The committee is helping with the Fulbright scheme by arranging programmes for social workers paying study-visits under the scheme.

SCHEMES MODIFIED

United Kingdom medical fellowships

In place of the separate medical fellowships and fellowships in chronic rheumatism, which, from 1945 and 1948 respectively, the Foundation has been awarding, a new scheme of medical fellowships has been instituted; the first selection of fellows takes place in June 1950. The new scheme is open to all medical men and women of the United Kingdom who wish to train further for teaching or research in any branch of medicine or surgery; but, as between equally qualified applicants, preference will be given to those who wish to receive training and experience in child health, industrial health, social medicine, psychiatry, or chronic rheumatism.

Under the old schemes 19 medical fellowships, from 141 applications, have been awarded and 5 fellowships out of 31 applications for chronic rheumatism; the latter were awarded for training with a view to specialist practice, but by the merger with the new medical scheme the emphasis is changed to future teachers and research workers.

FELLOWSHIPS, SCHOLARSHIPS, AND SIMILAR AWARDS

Travelling scholarships for farmers of the United Kingdom

The idea of travelling scholarships, to enable young practical farmers to study abroad their particular speciality and agricultural problems generally, was first tried in a scheme for England and Wales, and was later extended to Scotland. The Foundation is now satisfied of the value and benefits of the experiment, and a single scheme open to farmers of the whole Kingdom (including Northern Ireland) has been instituted, with the co-operation of the three Farmers' Unions. The first selection of applicants under the United Kingdom scheme is to be made in June 1950. Under the original schemes 15 scholarships were awarded from 211 English and Welsh applications and 5 out of 37 Scottish applications.

Visiting lectureships, special grants, &c.

The Foundation, believing in the benefits to be derived from visits of eminent persons in the sciences and arts between the different parts of the Commonwealth, has continued to promote these visits. In the year under review visits have been paid to Canada and the United States of America by Professor R. B. Bradlaw, M.D.S., F.R.C.S., F.D.S., R.C.S., and Professor F. C. Wilkinson, M.D., B.D.S., D.D.Sc., M.Sc., F.D.S., R.C.S., professors of dentistry in the Universities of Durham and Manchester respectively, Professor J. C. Spence, M.C., M.D., F.R.C.P., Nuffield professor of child health in the University of Durham, and Dr. J. H. Kellgren, F.R.C.S., director of the Rheumatism Research Centre, Manchester; to the United States of America only, by Professor F. H. Bentley, O.B.E., professor of surgery, University of Durham, Dr. A. Leslie Banks, M.D., F.R.C.P., professor-elect of human ecology, University of Cambridge, and Dr. G. D. Kersley, M.D., F.R.C.P., Royal National Hospital for Rheumatic Diseases, Bath; to Scandinavia by Mr. Howell E. James, C.B.E., late Chief Inspector, Ministry of Health; to Australia by Professor

FELLOWSHIPS, SCHOLARSHIPS, AND SIMILAR AWARDS

Bradlaw; to New Zealand by Professor C. E. Tilley, Ph.D., F.R.S., professor of mineralogy and petrology at the University of Cambridge, and Mr. Maurice Passmore, chairman of the seeds committee of the National Farmers' Union of England and Wales; and to South Africa by Sir John Cockcroft, K.B.E., F.R.S., director of the Atomic Energy Research Establishment, Harwell, Professor D. M. S. Watson, F.R.S., professor of zoology, University College, London, and Professor C. H. Best, C.B.E., M.A., M.D., D.Sc., F.R.C.S., F.R.S., professor of physiology, University of Toronto, Canada. The Foundation is grateful to all those named above for giving up their time to pay their respective visits and to their hosts in the overseas countries for the arrangements they made for, and the hospitality they showed to, the visitors.

The Foundation has in mind now to modify the scope and purpose of its visiting lectureships. The modification contemplated is that for the most part future scientific visitors shall be chosen for their knowledge in those fields which are believed, in the country visited, to offer special and fruitful opportunities of advancing fundamental research there. In non-scientific subjects the visits of eminent scholars will continue, as before, to be encouraged as a stimulus and a link with colleagues overseas.

NEW SCHEMES

Travelling fellowships for the Home Civil Service

The Home Civil Service travelling fellowship scheme is an experiment. It has been drawn up in co-operation with His Majesty's Treasury and is to operate till 1955. If, as is expected, the scheme is considered a success, it is hoped that His Majesty's Government will be able to make funds available for its continuance.

Under the terms of the scheme the Foundation offers three fellowships a year to civil servants at Principal and Assistant

FELLOWSHIPS, SCHOLARSHIPS, AND SIMILAR AWARDS

Secretary levels—and the equivalents in the scientific grades—to visit other parts of the Commonwealth and Empire (and possibly Western Europe) for a period of not less than six months and not more than one year. The scheme is comparable in almost all respects with the Civil Service Fellowships offered by the Commonwealth Fund of America, with the essential difference that the Commonwealth Fund fellows are limited to study in the United States of America. The Foundation is greatly indebted to His Majesty's Treasury and to the Commonwealth Fund for help in the establishment of the Foundation's scheme, and its thanks are also due to the Committee of Award of the Commonwealth Fund for so kindly undertaking the selection of candidates for Foundation fellowships. The first selection took place in March 1950.

His Majesty's Government, as its contribution to the scheme, pays the fellows' salaries and the Foundation meets subsistence, travelling, research, and other supplementary expenses.

Travelling scholarships for farmers of Australia, Canada, and New Zealand

The Foundation has recently been able to create, in co-operation with the Federated Farmers of New Zealand, a scheme to enable up to two practical farmers of New Zealand to come to the United Kingdom each year, up to 1954, to study practical farming methods and techniques and the particular problems which beset farmers in this country. The Foundation believes that the more knowledge there is of the problems and conditions of farming generally between the two countries, the greater will be the understanding, and that therein lies the germ of closer co-operation in the future and mutual gain.

Similar offers have been made to Canada and Australia, and it is hoped that schemes for these two countries will be in operation by the winter of 1950.

The Care of Old People

IN theory, at least, the three Acts which came into force on 5th July 1948 provided between them for the three principal needs of old people—a basic income for all and supplementary provision for special wants, accommodation and domestic care for those who cannot manage on their own, and full access to the whole range of medical skill and care in illness or growing infirmity. To the investigation and definition of these needs the Foundation contributed its share by commissioning and publishing the social survey by Mr. Seebohm Rowntree's committee and the medical survey by Dr. J. H. Sheldon; later, by co-operating with the Lord Mayor's Air Raid Distress Fund in establishing and endowing the National Corporation for the Care of Old People, the Foundation participated in supporting well-conceived schemes of voluntary bodies which wished to play their part, alongside—and if necessary ahead of—statutory bodies, in providing for the care and comfort of our increasing old-age population. During the first years of this quinquennium the Foundation will be paying over to the National Corporation the balance of the half a million pounds promised. While continuing thus to discharge through the National Corporation the third object laid upon it in its own trust deed, the Foundation is intending itself to consider some medical problems associated with ageing and to support research likely to elucidate its processes and effects.

In practice there is some growing uneasiness about the effect of recent legislation on the welfare of old people, especially in sickness and special need. There is now no compulsion on hospitals to admit a sick person, a fact often borne out by the tragic stories of old people dying alone and in neglect.

NATIONAL CORPORATION FOR THE
CARE OF OLD PEOPLE

Her Majesty THE QUEEN has been pleased to extend her gracious patronage to the National Corporation for the Care of Old People. The Foundation, which itself enjoys Her Majesty's patronage, rejoices that the National Corporation has been accorded the encouragement of a royal patron.

In its second annual report, for the year ending 30th September 1949, the National Corporation recorded that its grants during the year totalled £79,079. This is a sum considerably less than was expended in grants during the first year, and the explanation is to be found partly in the fact that the number of applications was less than half the previous year's number—owing, no doubt, to the first effects of the National Assistance Act, which abolished the Poor Law in favour of placing on major local authorities the duty to provide for all old people in need of accommodation and care which they cannot otherwise obtain. Wisely, however, the Act permits this duty to be discharged by collaboration with, and contribution to the funds of, voluntary bodies. Nevertheless the immediate effect of the Act on voluntary activity has been damping, because it has increased the difficulty of raising funds and support from local subscribers, who naturally doubt whether they need or can afford to contribute to voluntary societies now that these societies do not offer—as they did till recently—the only acceptable alternative to the chilly care of the old Poor Law. And quite apart from the diminution of gifts and donations, many responsible local voluntary committees paused to reconsider their roles in the new conditions of the welfare state.

This provision in the National Assistance Act for mutually helpful arrangements between statutory and voluntary agencies enables voluntary bodies to look to the local authority for

some financial assistance towards capital or maintenance costs, and it should encourage the local authority to increase available accommodation for old people by contributing to the funds of voluntary bodies by a grant—which is sure to be much less than would be the cost to the authority of providing its own accommodation. Unfortunately, as the National Corporation points out in its report, there have been some rebuffs and a good deal of initial awkwardness on both sides in the opening courtship for this convenient marriage between statutory and voluntary effort: the Act itself appears in part to be at fault, for it does not allow local authorities to obtain loans in order to make capital grants, and few authorities are willing to make such grants from revenue. It is not surprising, therefore, that the National Corporation enters 'a strong plea for even greater efforts by both voluntary and statutory bodies to overcome the obstacles which hinder true co-operation. For in this work, above almost any other, their joint efforts are vital to success. It should be treated as what it is, a national task, and not just a limited parochial effort swayed by local prejudices.' For its own part the National Corporation is insisting that voluntary bodies applying to it for grant-aid must also make application to their local authorities for some part of the cost of starting or maintaining a home.

During the first two years of its existence, the National Corporation made most of its grants towards the costs of setting up residential homes for able-bodied old people. Because in areas that suffered heavy bombing the requirements in accommodation for old people are still even more urgent than elsewhere, this policy will continue there and will be financed from the funds made available to the National Corporation by the Lord Mayor's National Air Raid Distress Fund. But elsewhere the National Corporation has now announced that its resources will for the most part be devoted to assisting in the very difficult task of caring for more infirm

old people, the very frail and the semi-sick, whose heavy demands and special needs exceed the resources of their own households or the care provided in a normal residential home. This is a category of old persons which, in the words of the National Corporation's report,

'is the responsibility, apparently, of no one: those in it are on the border-line between health and sickness, being neither fit enough, since they may need days in bed, to look after themselves or to live in a home for the able-bodied, nor yet sick enough to need hospital treatment. There appears to be an administrative gap between the National Health Service Act and the National Assistance Act and it is time that efforts were made to draw these two Acts closer. For it is a bold man who essays to draw a sharply defined dividing-line between health and sickness and does not admit that a patient might waver frequently between one and the other. We must ensure that all, whether in sickness, health or on the border-line between the two, can receive, without delay or argument as to whose responsibility they are, the treatment and care which they need.'

The need of this kind of old person, uncertainly balanced between sickness and comparative health, are perhaps the most pathetic of all, and certainly they raise the most difficult administrative problems. But, believing that demonstration is a more effective method than deputations for convincing administrators and others, the National Corporation is engaged in attempts to get agreement between hospital and welfare authorities in one or two areas to work out and try out schemes for running a 'half-way' home in actual practice. Ministries and authorities can and do close their ears to deputations, but they can less easily close their eyes to a working model of the kind of arrangement the National Corporation has in mind.

The increasing infirmity which often accompanies increasing age is a problem which every home for the able-bodied—whether run by local authorities or by a voluntary society

—has to face eventually; for, however spry the residents may be when admitted, some of them will decline into progressive ill health and will need much more physical help and more continuous care than a lightly-staffed home can easily provide. At present it is nearly always impossible to gain admittance for a case of this kind into hospital, and the complacent reply made for the Government in a recent debate in the House of Lords finds no confirmation in the experience of bodies like the National Corporation. Indeed there is a real danger that in a few years from now many of the homes recently established—though adequately staffed and equipped for the healthier type of old person—may degenerate wholesale into medical slums, unless some simple and smooth transition can be effected to a stage half-way between the two types of care provided respectively by the welfare and the health authorities.

A fuller statement of these and other points in the policy of the National Corporation for the Care of Old People is given in its second annual report and the only other item on which the Foundation would like to comment, and to congratulate the National Corporation, is the progress made in encouraging co-operative provision, by certain trade and professional benevolent funds, for the care of their elderly beneficiaries. The example set by the Food and Tobacco Trades Residential Clubs Ltd., which has set up its first residential home open to elderly members of the trades co-operating in the scheme, was quickly followed by the Crossways Trust Ltd., formed by twelve benevolent funds connected with professional organizations, which has also opened the first of what is planned as a series of homes for the care of retired professional people. In both cases the secretariat is provided by the National Corporation for the Care of Old People. It is likely that many other individual trade, professional, and Service benevolent funds—each of which may

THE CARE OF OLD PEOPLE

not separately have sufficient beneficiaries needing accommodation and care to justify its own home—could with advantage join with other funds, having beneficiaries with similar backgrounds, for the purpose of running joint residential homes. Such arrangements have the additional practical attraction, even for large funds with many beneficiaries, of making possible a chain of homes covering the different parts of the country and including special rest homes for the more infirm.

Miscellaneous Projects

IN this as in its previous programme the Foundation has allocated a sum for the support of projects which, though contributing in some way to its broad purposes, do not fall within any of the more closely defined fields of interest that the Foundation has chosen for the current quinquennium. The two grants recorded this year both aim—through academic channels, though at very different levels—at assisting towards a closer integration and intermingling of ideas within the British Commonwealth.

GRANTS

Association of Universities of the British Commonwealth

Last year the Association arranged the first of the annual meetings (in between the regular quinquennial congresses of Commonwealth universities) at which representatives of the executive heads of universities met to discuss their common problems, their meeting coinciding with the annual National Conference of Canadian Universities. The success of this innovation, for which the Foundation contributed a grant to help with travelling expenses, encouraged the Foundation to make a further grant of £16,000 to support these annual meetings, held in different Dominions in turn, for four more years. This year the conference is assembling in New Zealand, and the cost of fares for delegates will be considerable; but, quite apart from the business of the meeting, the opportunity for delegates from this country and the other Dominions to appreciate the university work and problems of New Zealand will be especially valuable and welcome. Since air-passages will be possible, the delegates' stay in New Zealand will be sufficiently prolonged to enable them to form

MISCELLANEOUS PROJECTS

some real acquaintance with their distant colleagues and to offer some influential advice and encouragement.

Canadian British Education Committee

The aim of this committee is to encourage boys and girls from schools in Britain to take their university courses in Canada, with a view either to settling permanently in Canada or to returning here with something of the refreshing outlook of a new country. The committee believes that many who would once have sought a career outside this country in India or the Colonies may now turn to the adventures and opportunities of the New World; if so, a Canadian university course would be the best bridge to that new life. For others the combination of English schooling and a North American university education might be a fitting preparation for some activity within the world-wide ramifications of British commerce. In addition to the advantages for the individual, there is no doubt that the presence of a number of British students in Canadian universities cannot but have benefits in the better representation and understanding of the British point of view.

The University of McGill, at Montreal, and the University of Toronto have each offered to hold open 100 vacancies a year in certain faculties, a gesture of considerable generosity, coming from universities which are crowded to the doors with their own students. Later it is hoped to embrace other Canadian universities in this scheme. Meanwhile it has been decided that State scholarships in this country can be tenable at certain Commonwealth universities, provided comparable facilities are not available in this country. The number of students who can go, under the auspices of this scheme, and exchange their sterling funds for Canadian currency, is being limited, however, during the next three years, by the authorities in this country. The Foundation has decided to contribute £300 towards the expenses of the committee over three years in arranging this scheme.

APPENDIX I

List of persons to whom Nuffield Foundation Fellowships and Scholarships have been awarded during the year ended 31st March 1950

(Note. The numbers before each name show the number of awards made under the scheme to date.)

NUFFIELD FOUNDATION MEDICAL FELLOWSHIPS

Home Country	Year of Appointment	Name (Age on Appointment)	Qualifications	Subject	Country of Study	Tenure of Award
Gt. Britain	1949	19. Robert Ainslie JAMESON Age 36 years	M.B., Ch.B., F.R.C.S. Lecturer in surgery, University of Glasgow.	Surgery	U.S.A.	1 year

NUFFIELD FOUNDATION CHRONIC RHEUMATISM FELLOWSHIPS

Gt. Britain	1949	5. John Norrie SWANSON Age 30 years	M.B., Ch.B., M.D., M.R.C.P. Class III appointment at Rheumatic Unit, Northern General Hospital, Edinburgh; clinical assistant, Royal Infirmary, Edinburgh; lecturer in electrotherapy, School of Physiotherapy, Royal Infirmary, Edinburgh.	Chronic rheumatism	Gt. Britain and U.S.A.	1 year
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NUFFIELD FOUNDATION DENTAL FELLOWSHIPS

Home Country	Year of Appointment	Name (Age on Appointment)	Qualifications	Subject	Country of Study	Tenure of Award
Gt. Britain	1949	9. William Ronald BURSTON Age 28 years	L.D.S. Assistant lecturer in orthodontics, School of Dental Surgery, University of Liverpool.	Orthodontics	Gt. Britain	2 years
Gt. Britain	1949	10. Alexander Creighton KERR Age 25 years	L.D.S. 1947-9 Royal Army Dental Corps. (Previously resident dental officer, Royal Victoria Infirmary, Newcastle.)	B.Sc. in pure science with honours in physiology.	Gt. Britain	4 years
Gt. Britain	1949	11. George Elliott MYERS Age 33 years	B.D.S., L.D.S. Assistant lecturer in dental surgery, University of Liverpool.	Operative dentistry	U.S.A.	1 year
Gt. Britain	1949	12. Geoffrey Layton SLACK, O.B.E. Age 37 years	L.D.S., D.D.S. Lecturer in preventive dentistry, School of Dental Surgery, University of Liverpool.	Bacteriology	Gt. Britain	1 year
Gt. Britain	1949	13. Peter Hugh STAPLE Age 31 years	B.D.S., B.Sc.	Ph.D. in cell physiology	Gt. Britain	2 years
Gt. Britain	1949	14. Anne Patricia WILLIAMS Age 24 years	B.D.S.	Oral pathology	Gt. Britain	2 years

NUFFIELD FOUNDATION DENTAL SCHOLARSHIPS

Home Country	Year of Appointment	Name (Age on Appointment)	Qualifications	Subject	Country of Study	Tenure of Award
Gt. Britain	1949	4. Malcolm Neville NAYLOR Age 23 years	Student at University of Birmingham.	Honours B.Sc. in anatomy and physiology	Gt. Britain	2 years

NUFFIELD FOUNDATION TRAVELLING SCHOLARSHIPS FOR FARMERS

SCOTLAND

Gt. Britain	1949	4. James FORRESTER Age 24 years	Farming in conjunction with father: Gartartan Home Farm, Gartmore, By Stirling.	Cropping and dairying	Gt. Britain and Canada	6 months
Gt. Britain	1950	5. Alexander Nisbet LOUDON Age 25 years	Managing Ladyton Farm, Ayrshire, Scotland.	Breeding and rearing of dairy stock, milk production, and grassland management	Denmark, Holland, and U.S.A.	6 months

Nuffield Foundation Travelling Scholarships for Farmers (*continued*)

ENGLAND AND WALES

Home Country	Year of Appointment	Name (Age on Appointment)	Qualifications	Subject	Country of Study	Tenure of Award
Gt. Britain	1950	12. John Henry Francis GRADON Age 32 years	Farming Little Blackhill, Craswall, Nr. Abergavenny, Monmouth.	Hill-sheep and cattle farming, and seed potatoes	Gt. Britain and Denmark	6 months
Gt. Britain	1950	13. Ernest Harold JONES Age 31 years	Farming The Tunnels, Upper Redbrook, Nr. Monmouth.	Mushroom-growing	U.S.A.	3 months
Gt. Britain	1949	14. Peter LANGMEAD Age 30 years	Farming Wicks Farm, Yapton, Arundel, Sussex	Mixed farming with particular reference to poultry and dairy farming	U.S.A. and New Zealand	6 months
Gt. Britain	1949	15. John LUCAS Age 34 years	Farming Deans Farm, Caversham, Reading, Berks.	Dairy and mixed farming	U.S.A.	6 months

NUFFIELD FOUNDATION TRAVELLING FELLOWSHIPS IN EXTRACTION METALLURGY

Home Country	Year of Appointment	Name	Qualifications	Countries to be Visited	Tenure of Award
Gt. Britain	1950	12. Hugh O'NEILL	M.Met., D.Sc., F.I.M. Professor of metallurgy, University College of Swansea.	Canada and U.S.A.	3 months
Gt. Britain	1950	13. Edmund James PRYOR	A.R.S.M., D.I.C., M.Inst.M.M., A.M.I.M.M.E., A.M.Inst.M.&M. Senior lecturer, Royal School of Mines.	Africa	6 months
Gt. Britain	1950	14. Frederick Denys RICHARDSON	B.Sc., Ph.D. Nuffield Foundation research fellow in extraction metallurgy, Imperial College of Science and Technology, University of London.	Canada and U.S.A.	6 months
Australia	1950	15. Edgar Clynton Ross SPOONER	M.Sc., B.E., D.Sc., D.Phil., M.I.Chem.E., M.Aust.I.M.M., F.I.M., F.R.I.C. Professor of mining and metallurgy, University of Adelaide, and Director of the Bonython Laboratories, South Australia School of Mines and Industries.	Belgian Congo, N. Rhodesia, and the Witwatersrand	3 months
Australia	1950	16. George Mervyn WILLIS	M.Sc. Senior lecturer in chemical metallurgy, University of Melbourne.	Gt. Britain	6 months

NUFFIELD FOUNDATION POSTGRADUATE SCHOLARSHIPS IN EXTRACTION METALLURGY

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Home Country	Year of Appointment	Name (Age on Appointment)	Qualifications	Subject	Country of Study	Tenure of Award
Gt. Britain	1950	16. James Gordon PARR Age 22 years	B.Sc. 1947-8 Research assistant at Universities of Leeds and Durham. (1947: awarded Nuffield Foundation vacation scholarship in extraction metallurgy.)	Non-ferrous extraction metallurgy	Canada	4 months

NUFFIELD FOUNDATION VACATION SCHOLARSHIPS IN EXTRACTION METALLURGY

Home Country	Year of Appointment	Name (Age on Appointment)	Student at	Country of Vacation Work	Tenure of Award
Gt. Britain	1950	28. Peter CONDER Age 26 years	Royal School of Mines, University of London.	Noranda Mines, Ltd., Quebec, Canada	3 months
Gt. Britain	1950	29. Alan CRACKNELL Age 22 years	University of Leeds.	Hudson Bay Mining & Smelting Co. Ltd., Flin Flon, Manitoba, Canada	3 months
Gt. Britain	1950	30. Phillip Bernard EYRE Aged 27 years	King's College, University of Durham.	Sweden (plant not yet decided)	3 months
Gt. Britain	1950	31. Norman GIBSON Age 25 years	King's College, University of Durham.	Rhokana Corpora- tion., Ltd., Nor- thern Rhodesia	3 months

APPENDIX I (continued)

Gt. Britain	1950	32. John Richard COX GOUGH Age 20 years	University College of Cardiff.	Noranda Mines, Ltd., Quebec, Canada	3 months
Gt. Britain	1950	33. Martin Oswald HOLT Age 23 years	Royal School of Mines, University of London.	Consolidated Mining & Smelting Co. of Canada Ltd., Trail, B.C., Canada	3 months
Gt. Britain	1950	34. Alan Jeffery ROBINSON Age 24 years	Royal School of Mines, University of London.	Consolidated Mining & Smelting Co. of Canada Ltd., Kimberley, B.C., Canada	3 months
Gt. Britain	1950	35. Hugh David SAWYER Age 33 years	University College of Swansea.	Consolidated Mining & Smelting Co. of Canada Ltd., Trail, B.C., Canada	3 months
New Zealand	1950	36. Donald Robert Keith SMITH Age 22 years	School of Mines and Metallurgy, University of Otago, Dunedin, New Zealand.	Broken Hill Proprietary Co., Australia	3 months
India	1950	37. Yellambalasi Chandrasekharaiya SUBRAHMANYA Age 24 years	Indian Institute of Science, Bangalore.	Stewart & Lloyds Co., Ltd., Corby, England	3 months
Gt. Britain	1950	38. Frank Idris THOMAS Age 21 years	School of Metalliferous Mining, Camborne, Cornwall.	Roan Antelope Copper Mines Ltd., Luanshya, Northern Rhodesia	3 months

NUFFIELD FOUNDATION DOMINION MEDICAL TRAVELLING FELLOWSHIPS (1948-54)

APPENDIX I (continued)

Home Country	Year of Appointment	Name (Age on Appointment)	Qualifications	Subject	Country of Study	Tenure of Award
Canada	1949	50. Guy Ernest JORON Age 32 years	B.A., M.D. Assistant resident in medicine, Montreal General Hospital.	Metabolism and nutrition	Gt. Britain	1 year
Canada	1949	51. John Lloyd SILVERSIDES Age 34 years	B.Sc., M.D., L.M.C.C. University fellow in neurology, Toronto General Hospital.	Neurology	Gt. Britain	1 year
Canada	1949	52. Norman Burwell George TAYLOR Age 31 years	M.D. Lecturer, Department of Physio- logy, University of Western Ontario.	Anti-diuretic ex- traction, and identification of anti-diuretic material	Gt. Britain	1 year
Australia	1950	53. William Ross ADEY Age 27 years	M.B., B.S. Lecturer in anatomy, University of Adelaide.	Anatomy	Gt. Britain	1 year
Australia	1950	54. John William PERRY Age 32 years	M.B., B.S. Pathologist, Children's Hospital, Melbourne.	Paediatrics and pathology	Gt. Britain	1 year
Australia	1950	55. Victor WYNN Age 29 years	M.B., B.S. Junior fellow, National Health Medical Research Council, Aus- tralia.	Clinical bio- chemistry	Gt. Britain	1 year
South Africa	1949	56. Jan Andries BEYERS Age 28 years	M.B., Ch.B. Clinical assistant, Department of Internal Medicine, General Hospital, Pretoria.	Cardiology	Gt. Britain	1 year

NUFFIELD FOUNDATION DOMINION TRAVELLING FELLOWSHIPS IN THE HUMANITIES AND SOCIAL SCIENCES

Home Country	Year of Appointment	Name (Age on Appointment)	Qualifications	Subject	Country of Study	Tenure of Award
New Zealand	1949	7. Henry HUDSON Age 33 years	M.A. Lecturer in philosophy, Victoria University College, Wellington, New Zealand.	Study of the mind-body problem	Gt. Britain	1 year
Australia	1950	8. Alan George Lewers SHAW Age 33 years	B.A. (Melbourne), M.A. (Oxon.) Dean of Trinity College, Melbourne, and part-time lecturer in history, University of Melbourne.	History, with particular reference to the history and records of the early settlers in Australia	Gt. Britain	1 year
South Africa	1949	9. Elizabeth SNEDDON Age 42 years	M.A., L.R.A.M. Acting head of Department of English, University of Natal.	Study of developments in speech education	Gt. Britain	1 year
Australia	1950	10. John Basil THORNTON Age 33 years	B.A., B.Sc. Lecturer at Sydney Teachers' College in chemistry and physics and in the history and philosophy of science.	History and philosophy of science	Gt. Britain	1 year

NUFFIELD FOUNDATION DOMINION TRAVELLING FELLOWSHIPS IN NATURAL SCIENCES

APPENDIX I (continued)

Home Country	Year of Appointment	Name (Age on Appointment)	Qualifications	Subject	Country of Study	Tenure of Award
Australia	1950	5. Hans Adolph BUCHDAHL Age 30 years	B.Sc., A.R.C.S., D.Sc. Research physicist and part-time lecturer, University of Tasmania.	Theoretical physics	Gt. Britain	1 year
Australia	1950	6. Lloyd Hugh Parker JONES Age 27 years	B.Ag.Sc., D.Ph., A.R.A.C.I. Research officer in agricultural chemistry, University of Melbourne.	Agricultural chemistry	Gt. Britain	1 year
New Zealand	1949	7. Noel Vincent RYDER Age 31 years	M.Sc. Senior lecturer in physics, Victoria University College, Wellington, New Zealand.	Cosmic rays	Gt. Britain	1 year
South Africa	1949	8. Max LAMCHEN Age 37 years	B.Sc., H.E.D., M.Sc., Ph.D., D.I.C. Lecturer, University of Cape Town.	Organic chemistry	Gt. Britain	1 year

NUFFIELD FOUNDATION TRAVELLING SCHOLARSHIPS FOR FARMERS SOUTHERN RHODESIA

Home Country	Year of Appointment	Name (Age on Appointment)	Qualifications	Subject	Country of Study	Tenure of Award
S. Rhodesia	1950	9. Stephen George ADAMS Age 23 years	Managing: Zumbani Farm, P.B. Inyazuia.	Cattle, pigs, and general farming	Gt. Britain	6 months
S. Rhodesia	1950	10. Robin Hilton LITTLE Age 21 years	Managing: Springs Farm, Box 489, Bulawayo.	Production of maize, beef cattle, and dairying	Gt. Britain	6 months

NUFFIELD FOUNDATION TRAVELLING FELLOWSHIPS FOR HOME CIVIL SERVICE

Gt. Britain	1950	1. James Pickering DODDS Age 37 years	B.A. Assistant Secretary, Whitley Councils Division, Ministry of Health.	Administrative organization of health services	Australia and New Zealand	Up to 1 year
Gt. Britain	1950	2. Thomas Alan OXLEY Age 39 years	B.Sc., A.R.C.S. Principal Scientific Officer, D.S.I.R., in charge of new food-storage section.	Grain-storage	Australia and New Zealand	Up to 1 year
Gt. Britain	1950	3. Frederick Robert Peter VINTER Age 36 years	M.A. Assistant Secretary, H.M. Treasury.	Development of capital investment	India	Up to 1 year

THE NUFFIELD

Balance Sheet

LIABILITIES				£	s.	d.
NUFFIELD FUND CAPITAL ACCOUNT	.	.	.	10,000,000	0	0
AUXILIARY FUND:	£	s.	d.	£	s.	d.
<i>Oliver Bird Fund</i>						
Balance at 31st March 1949	460,028	1	10			
Add Income on investments and deposit account for the year to 31st March 1950	14,307	14	8			
Profit on sale of investments	1,040	7	9			
Transfer from Nuffield Fund Grants Reserve	30,000	0	0			
	505,376	4	3			
Less Grants allocated during year	38,735	0	0			
				466,641	4	3
<i>Elizabeth Nuffield Home Fund</i>				26,508	16	6
Sundry donations received to 31st March 1950				504	10	0
				493,654	10	9
GENERAL RESERVE FUND						
Balance as at 31st March 1949				458,716	13	6
Add Income on investments for the year to 31st March 1950				12,954	5	1
Transfer from income for the year to 31st March 1950				54,936	11	9
				526,607	10	4
GRANT FOR PURCHASE OF EQUIPMENT OF FOUNDATION HOUSE				25,500	0	0
RESERVE FOR FURNISHING OF NEW OFFICES				5,000	0	0
INCOME AND EXPENDITURE ACCOUNT				3,111	0	8
PROVISIONS FOR UNEXPENDED GRANTS FROM AUXILIARY FUND				27,217	11	0
(See Appendix V, section C, col. 5)						
PROVISIONS FOR UNEXPENDED GRANTS FROM NUFFIELD FUND						
Second quinquennium				533,410	0	7
(See Appendix V, section A, col. 5)						
First quinquennium				792,353	17	7
(See Appendix V, section B, col. 5)						
				1,325,763	18	2
UNSPENT BALANCES OF FELLOWSHIP AWARDS				40,530	8	6
SUNDRY CREDITORS				2,297	14	10
<i>Note. Commitments actually entered into, but not yet allocated, by the trustees at this date amount to £173,000 from the Nuffield Fund and £31,500 from the Auxiliary Fund (see Appendix V, sections A and C, column 6).</i>						
				£12,449,682	14	3

Auditor's Report to the Trustees of the Nuffield Foundation

WE have examined the above balance sheet and the annexed accounts for the year to 31st March 1950, with the books and vouchers of the Foundation produced to us, and we certify them to be in accordance therewith.

The investments (with the exception of the Morris Motors Ltd. Stock Units, which

APPENDIX II

APPENDIX II

£12,449,682 14 3

(Signed) **THORNTON & THORNTON,**
Chartered Accountants.

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Schedule of Investments and Interest and Dividends thereon—31st March 1950

	As at 31st March 1950			Year to 31st March 1950		
	Nominal value		Book value		Market value	
	£	s. d.	£	s. d.	£	s. d.
NUFFIELD FUND						
4,809,524 Morris Motors Ltd. Ordinary Stock Units of 5s. each at market price on date of transfer	1,202,381	0 0	10,000,000	0 0	6,913,690	15 0
						535,606 1 8
GENERAL RESERVE FUND						
2½% National War Bonds 1954-56	80,236	17 10	80,866	11 9	81,440	8 11
3% Savings Bonds 1965-75	177,725	1 6	181,979	6 6	166,172	18 11
3% National Defence Bonds	2,000	0 0	2,000	0 0	2,000	0 0
3% Savings Bonds 1960-70	44,531	17 11	45,906	3 8	42,305	6 0
2½% Savings Bonds 1964-67	208,181	4 6	212,541	0 6	193,695	5 7
	512,675	1 9	523,293	2 5	485,613	19 5
						12,954 5 1
GRANTS RESERVE FUND						
1½% Exchequer Bonds 1950	...		...		...	
2½% National War Bonds 1949-51	215,379	6 9	215,379	6 9	218,071	11 7
2½% National War Bonds 1951-53	111,591	15 8	111,591	15 8	113,405	3 0
2½% National War Bonds 1952-54	109,820	18 3	109,820	18 3	111,193	13 6
2½% National War Bonds 1954-56	4,904	7 6	4,904	7 6	4,977	18 10
3% Savings Bonds 1960-70	37,791	13 8	37,791	13 8	35,902	2 0
	479,488	1 10	479,488	1 10	483,550	8 11
						12,041 19 4
						3,824 3 10
						2,481 18 10
						1,781 7 8
						2,698 1 10
						122 12 2
						1,133 15 0

AUXILIARY FUND (Oliver Bird Fund)

W. & T. Avery Ltd. Ordinary £1 Units	1,000	0	0	5,392	17	6	37	6	10
Barclays Bank Ltd. 'A' £1 Units	2,600	0	0	7,203	17	4	259	1	1
Barclays Bank (Dominion, Colonial & Overseas) 'A' £1 Units	2,500	0	0	7,271	7	0	184	3	4
Bass Ratcliffe & Gretton Ltd. Ordinary £1 Units	550	0	0	4,942	15	9	240	0	0
Boots Pure Drug Co. Ltd. 1850 Ordinary ss. shares	462	10	0	4,678	16	9	125	0	0
British American Tobacco Co. Ltd. Ordinary £1 registered Units	875	0	0	5,111	12	7	190	14	1
British Electric 3% Guaranteed Stock 1968-73	38,883	2	10	40,000	0	0	1,166	9	10
British Transport 3% Guaranteed Stock 1978-88	39,957	8	3	40,000	0	0	1,198	14	5
J. & J. Colman Ltd. Ordinary £1 Units	1,100	0	0	4,901	7	6	190	3	4
Wm. Cory & Sons Ltd. Ordinary £1 Units	1,050	0	0	4,989	2	0	206	10	0
Distillers Co. Ltd. 5,250 Ordinary 4s. Units	1,050	0	0	5,071	1	3	191	14	0
Dunlop Rubber Co. Ltd. Ordinary £1 Units	1,400	0	0	4,942	6	6	118	10	1
Exchequer Bonds 1½% 1950	...			...			781	6	6
General Electric Co. Ltd. Ordinary £1 Units	1,100	0	0	5,059	4	0	188	9	9
W. T. Henleys Telegraph Works Co. Ltd. 4,000 Ordinary ss. Units	1,000	0	0	4,765	7	6	94	16	11
Lever Bros. & Unilever Ltd. Ordinary £1 Units	2,000	0	0	5,252	10	6	190	0	0
London Assurance 600 £2. 10s. Shares £1. ss. paid	750	0	0	10,685	19	6	330	17	2
Metal Box Co. Ltd. Ordinary £1 Units	1,100	0	0	4,993	15	3	24	11	8
North British & Mercantile Insurance Co. Ltd. 900 Ordinary Shares 25s. each	1,125	0	0	10,043	4	9	312	7	6
Pearl Assurance Co. Ltd. Ordinary £1 Shares	450	0	0	9,352	5	6	402	5	6
Phoenix Assurance Co. Ltd. £1 Shares	600	0	0	10,190	3	0	378	12	6
Prudential Assurance Co. Ltd. 'A' £1 Shares	300	0	0	9,727	14	0	407	6	2
Royal Bank of Scotland Stock	3,300	0	0	15,074	15	10	403	15	0
Royal Exchange Assurance £1 Units	850	0	0	10,129	6	9	285	14	2
3% Savings Bonds 1955-65	101,199	15	0	100,000	0	0	3,035	19	11
3% Savings Bonds 1965-75	38,835	19	0	40,000	0	0	1,165	1	7
H. G. Simmonds Ltd. Ordinary £1 Units	850	0	0	4,894	13	0	235	4	9
Sun Life Assurance Society £1 Shares	900	0	0	10,043	1	6	326	4	9
Union Bank of Australia Ltd. 1,000 £15 Shares £5 paid	5,000	0	0	9,987	9	6	337	10	0
Union Discount Co. of London, Ltd. £1 Units	5,300	0	0	15,136	14	9	530	0	0
Westminster Bank Ltd. 3,000 £4 Shares £1 paid	3,000	0	0	14,405	15	6	540	0	0
F. W. Woolworth & Co. Ltd. 2,300 Ordinary ss. Units	575	0	0	4,666	18	0	201	5	0
	£259,663	15	1	£428,914	3	0	£392,473	2	8
									£14,279 15 10

Income and Expenditure Account

<i>Dr.</i>	<i>£</i>	<i>s.</i>	<i>d.</i>	<i>£</i>	<i>s.</i>	<i>d.</i>
To Central office organization						
Salaries and allowances	16,882	7	7			
Office maintenance	2,859	17	8			
Printing, stationery, postage, telephone	3,351	14	3			
Publications and incidentals	527	1	7			
Legal expenses	59	1	8			
Audit expenses	161	0	0			
				23,841	2	9
„ Travelling and entertainment	1,973	12	7			
„ Expenses of conferences and committees	1,268	17	7			
„ Expenses of operating fellowship schemes and of committees	1,648	18	1			
				4,891	8	3
„ Depreciation of furniture and fittings				2,038	6	9
„ Reserve for furnishing of new office accommodation				5,000	0	0
„ Expenses of Managing Trustees:						
Personal allowances	1,800	0	0			
Grants in lieu of personal allowances	1,000	0	0			
Travelling expenses	43	8	5			
				2,843	8	5
„ Grants allocated during year	473,690	0	0			
Less grants refunded	6,250	0	0			
				467,440	0	0
„ Transfer to General Reserve Fund				54,936	11	9
„ Balance carried forward				3,111	0	8
				<u>£564,101</u>	<u>18</u>	<u>7</u>

for the year ended 31st March 1950

	£	s.	d.	Cr. £	s.	d.
By Surplus brought forward from previous year	.	.	.	14,736	1	7
„ Dividends on Morris Motors Ltd. Stock	.	.	.	535,606	1	8
„ Interest on investments of Grants Reserve Fund	12,041	19	4			
Less Transfer to Investment Reserve Account	2,180	1	11			
„ Bank and other interest	.	.	.	9,861	17	5
				3,897	17	11

£564,101 18 7

Schedule of Grants

Section A. Grants allocated in

	(1) <i>Allocations transferred from first quinquennium</i>
	£
CONTINUATION OF PAST PROGRAMME	
<i>Medical Sciences</i>	
Nuffield Institute of Medical Research, Oxford: radiological research into normal health	...
University of London, Institutes of Child Health and of Education: child-development study	...
The Queen's University, Belfast, Department of Social and Preventive Medicine: health in the linen industry	...
University of Sheffield, Department of Social and Industrial Medicine: nutritional survey	...
Joint Committee of R.C.O.G., Population Investigation Committee, and Institute of Child Health: second follow-up inquiry	...
<i>Natural Sciences</i>	
University of London, Birkbeck College, Biomolecular Research Laboratory	...
University of London, University College, Department of Anatomy: additional grant	...
British Agricultural Policy: expenses of scientific study-group	...
Reserve for a conditional grant	...
<i>Social Sciences</i>	
Third Statistical Account of Scotland (Scottish Council of Social Service)	...
<i>The Care of Old People</i>	
Elizabeth Nuffield Home: maintenance	...
Elderly Nurses National Home, Bournemouth: additional grant	...
	...
FUNDAMENTAL RESEARCH	
(a) IN THE UNITED KINGDOM	
<i>Biological Studies</i>	
University of London, King's College, Department of Zoology	...
University of London, University College, Department of Anatomy	...
University of London, University College, Department of Embryology	...
University of Oxford, Laboratory of Chemical Crystallography	...
Strangeways Research Laboratory, Cambridge	...
	...

and Allocations

the second quinquennium

(2) Allocations for the year ended 31.3.50	(3) Period over which payable	(4) Payments from allocations during the year ended 31.3.50	(5) Balance of allocations unpaid at 31.3.50	(6) Allocations to be met from income of succeeding years
£		£	£	£
2,000	2 years	1,400	600	...
3,000	2 years	...	3,000	...
900	...	900	...	...
1,000	...	500	500	...
6,000	...	6,000	...	...
32,000	3 years	6,000	26,000	...
740	2 years	358	382	...
3,000	1 year	1,193	1,807	...
7,000	7 years	...	7,000	...
2,000	3 years	750	1,250	...
2,000	1 year	1,433	567	...
2,700	...	...	2,700	...
62,340	...	18,534	43,806	...
8,250	5 years	...	8,250	...
10,000	5 years	...	10,000	...
1,500	3 years	...	1,500	...
15,000	5 years	2,250	12,750	...
12,000	5 years	1,200	10,800	...
46,750	...	3,450	43,300	...

continued overleaf

APPENDIX V (continued)

	(1) <i>Allocations transferred from first quinquennium</i>
	£
FUNDAMENTAL RESEARCH (contd.)	
<i>Sociological Studies</i>	
University of Aberdeen, Department of Economics	...
Family Welfare Association and Tavistock Institute of Human Re- lations	...
University of London, London School of Economics and Political Science: Division of Research Techniques	...
Joint mental-survey committee of Population Investigation Com- mittee and Scottish Council for Research in Education	...
	...
(b) OVERSEAS	
New South Wales University of Technology: Nuffield research chair of mechanical engineering	...
RESEARCH INTO PRACTICAL PROBLEMS	
Investigation of Motion and Time Studies	...
FELLOWSHIPS AND SCHOLARSHIPS	
<i>(a) Dominion and Colonial students' residence</i>	
Foundation House: maintenance	...
Dominion Students Hall Trust	...
<i>(b) Schemes for the United Kingdom</i>	
Medical fellowships	15,031
Dental fellowships and scholarships	9,823
Travelling scholarships for farmers	2,465
Travelling fellowships for Home Civil Servants	...
Interchange scheme for training of social workers and administrators	2,500
Special grants in aid of research and training.	...
Reserve for new schemes	...
<i>(c) Schemes for Dominions and Colonies</i>	
Dominion travelling fellowships:	
India, Pakistan, and Ceylon	...
Canada, Australia, New Zealand, South Africa—in medicine	54,556
Canada, Australia, New Zealand, South Africa—in the humanities, the social and natural sciences	1,217
Southern Rhodesia farming scholarships	1,683
Colonial medical visitors	25,000
Reserve for new schemes	...
<i>(d) Schemes open to whole Commonwealth</i>	
Fellowships and scholarships in extraction metallurgy	18,244
Visiting lectureships, special grants, &c.	4,823
	135,342

(2) Allocations for the year ended 31.3.50	(3) Period over which payable	(4) Payments from allocations during the year ended 31.3.50	(5) Balance of allocations unpaid at 31.3.50	(6) Allocations to be met from income of succeeding years
£		£	£	£
6,000	3 years	1,000	5,000	...
12,000	3 years	...	12,000	...
10,000	5 years	1,000	9,000	...
5,000	5 years	1,000	4,000	...
33,000	...	3,000	30,000	...
25,000	10 years	...	25,000	...
2,000	1 year	505	1,495	...
3,000	1 year	1,500	1,500	...
75,000	5 years	15,000	60,000	75,000
50,000	5 years	3,152	61,879	...
...	5 years	...	9,823	...
21,400	5 years	1,655	22,210	...
22,500	5 years	...	22,500	...
...	5 years	1,500	1,000	...
13,100	5 years	5,983	7,117	...
4,000	5 years	...	4,000	16,000
9,000	5 years	...	9,000	35,000
...	5 years	3,481	51,075	...
3,000	5 years	4,037	180	35,000
4,200	5 years	1,000	4,883	...
...	5 years	5,000	20,000	...
3,000	5 years	...	3,000	12,000
...	5 years	4,290	13,954	...
17,100	5 years	435	21,488	...
225,300	...	47,033	313,609	173,000

APPENDIX V (continued)

	(1) <i>Allocations transferred from first quinquennium</i>
	£
THE CARE OF OLD PEOPLE	
National Corporation for the Care of Old People	...
MISCELLANEOUS PROJECTS	
Association of Universities of the British Commonwealth: expenses of delegates to annual congresses	...
Canadian British Education Committee	...
Reserve for a conditional grant	...
	...
SUMMARY OF ALLOCATIONS	
<i>Nuffield Fund</i>	
Continuation of past programme	...
Fundamental Research	
(a) In the United Kingdom:	
Biological Studies	...
Sociological Studies	...
(b) Overseas	...
Research into Practical Problems	...
Fellowships and Scholarships	135,342
The Care of Old People	...
Miscellaneous Projects	...
	135,342
<i>Auxiliary Fund (Oliver Bird Fund)</i>	
(See Section C overleaf)	3,665
TOTAL	139,007

Section B. Summary of grants

	(1) <i>Balance of allocations unpaid at 31.3.49</i>
	£
Medical Sciences	410,964
Natural Sciences	162,397
Social Sciences	97,150
Fellowships and Scholarships	228,063
The Care of Old People	385,217
Miscellaneous Projects	18,800
	1,302,591

(2) Allocations for the year ended 31.3.50	(3) Period over which payable	(4) Payments from allocations during the year ended 31.3.50	(5) Balance of allocations unpaid at 31.3.50	(6) Allocations to be met from income of succeeding years
£		£	£	£
60,000	1 year	...	60,000	...
16,000	4 years	3,000	13,000	...
300	3 years	100	200	...
3,000	1 year	...	3,000	...
19,300	...	3,100	16,200	...
62,340	...	18,534	43,806	...
46,750	...	3,450	43,300	...
33,000	...	3,000	30,000	...
25,000	...	...	25,000	...
2,000	...	505	1,495	...
225,300	...	47,033	313,609	173,000
60,000	...	...	60,000	...
19,300	...	3,100	16,200	...
473,690	...	75,622	533,410	173,000
38,735	...	15,182	27,218	31,500
512,425	...	90,804	560,628	204,500

allocated in the first quinquennium

(2) Payments during the year ended 31.3.50	(3) Allocations not required	(4) Allocations transferred to second quinquennium	(5) Balance of allocations funded but unpaid at 31.3.50
£	£	£	£
91,130	...	...	319,834
43,567	6,250	...	112,580
28,750	...	...	68,400
84,192	...	...	8,529
112,881	...	135,342	272,336
8,125	...	...	10,675
368,645	6,250	135,342	792,354

	(1) Total allocations
	£
OLIVER BIRD FUND	
<i>Research on Cortisone, ACTH, &c.</i>	
University of Cambridge, School of Biochemistry	11,000
University of Cambridge, Chemical Laboratory	5,000
University of Oxford, Dyson Perrins Laboratory	10,000
Royal Technical College, Glasgow, School of Chemistry	2,200
University of Manchester, Rheumatism Research Centre	5,600
University of Leeds, Department of Biomolecular Structure	5,000
St. Mary's Hospital Medical School, Department of Medicine	10,000
<i>Clinical trials in rheumatism</i>	
Allocation to meet grants for clinical trials	20,000
<i>Other research on rheumatism</i>	
London Hospital Medical College	500
University of St. Andrews, Department of Anatomy	3,000
St. Thomas' Hospital, Department of Physical Medicine	1,600
	73,900

grants allocated

(2) <i>Allocations transferred from first quinquennium</i>	(3) <i>Allocations during the year ended 31.3.50</i>	(4) <i>Payments from allocations during the year ended 31.3.50</i>	(5) <i>Balance of allocations unpaid at 31.3.50</i>	(6) <i>Allocations to be met from income of succeeding years</i>
£	£	£	£	£
...	4,500	1,750	2,750	6,500
...	2,000	1,000	1,000	3,000
...	5,000	2,000	3,000	5,000
...	1,100	550	550	1,100
...	2,000	...	2,000	3,600
...	3,000	1,000	2,000	2,000
...	2,000	...	2,000	8,000
3,665	16,335	7,582	12,418	...
...	500	500	...	...
...	1,500	...	1,500	1,500
...	800	800	...	800
3,665	38,735	15,182	27,218	31,500

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